# Community High School District #128
# Libertyville High School
# Studio Theater Lighting Control and Dimming Replacement
## BID DOCUMENTS

**Part 1 - General**

1) SUMMARY

A) Libertyville High School seeks to replace the Studio Theater Lighting System - including dimmers/control board/and wiring infrastructure as needed.

B) This contract shall consist of the installation of dimmers, control wiring infrastructure, dismantle and removal of current equipment at Libertyville High School 708 West Park Avenue, Libertyville, IL 60048.

2) SCOPE

A) The contractor shall provide all labor, materials, equipment, insurance and testing as required to provide a complete project within time schedules included herein and ready for the use intended as outlined below.

B) Project to be started after June 10, 2013 and to be completed no later than August 9, 2013.

C) Libertyville High School will provide a “walk-through” for prospective bidders on February 21, 2013 at 10:30 AM, meeting in the front lobby of Libertyville High School. Interested contractors are strongly encouraged to attend this “walk-through”, as no other opportunities will be available to visit the campus prior to bid opening.

D) Each bidder shall add an amount of $15,000 to their base bid which may be used for contingencies related to this project based on the age and condition of the current equipment, electrical service, and wiring. Any or all of this amount shall be paid to the successful bidder for contingent work in consultation with and at the sole discretion of Community High School District #128.

3) RELATED DOCUMENTS

A) Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications section, apply to work in this section.

B) Division 16 Basic Materials and Methods sections apply to work in this section.

4) DESCRIPTION OF WORK

A) The intent of this specification is to provide for the furnishing, installing, testing and placing in operation the necessary equipment for a complete lighting system in the Studio Theater.

B) The Base Bid is for the replacement of the dimming system, control wiring, and architectural control that is currently installed. The extent of the work is explained in following specifications.

C) The Alternate Bid shall provide for the removal of existing electrical circuit wiring and plugging strips and replacement of the plugging strips and wiring infrastructure.

D) The Alternate Console Bid shall provide for an ETC Ion Control board found in the Alternate Console specifications.

E) The Theatrical Dealer shall provide all labor and materials and make all necessary arrangements, except as specifically noted herein, so that when the contractor(s) is/are

finished a fully working system will be turned over to the owner. Any errors, omissions, or ambiguities are not to condition this requirement, but shall be brought to the attention of the Theatrical Dealer in their possible effect on the intent of this specification.

5) QUALIFICATIONS

A) The manufacturer shall be one who has been continuously engaged in the production of theatrical lighting and control equipment for at least fifteen (15) years and in the manufacture of solid state electronic control systems and dimmers for ten (10) years.

B) Subject to the above requirements, the equipment indicated within this Section shall be by one of the following manufacturers:

(1) Dimming and Control
1. Electronic Theatre Controls, Inc. (ETC), Middleton, Wisconsin

(2) Wiring Devices
1. Electronic Theatre Controls, Inc. (ETC), Middleton, Wisconsin

C) All equipment shall be provided by a qualified, factory-authorized theatrical equipment dealer. The dealer shall be one who has been continuously engaged in the sale, rental and service of theatrical lighting equipment for at least twenty (20) years and shall have at least fifteen (15) years experience in the sales and installation of similar systems. Such dealer must maintain a full-service facility within fifty (50) miles of the project site. Such dealer must be a member of the Professional Lighting and Sound Association (PLASA) and adhere to the PLASA Code of Conduct. The Dealer shall be factory certified to provide warranty service for all of the equipment in the Section.

D) The Dealer shall maintain an active rental inventory of theatrical equipment similar in nature the equipment called for in this Section. If any equipment is delayed or backordered from the manufacturer, the Dealer, at no cost to the owner, shall provide rental equipment to insure an operating system by the substantial completion date.

E) Dealer shall be responsible for the installation, integration, operation and performance of all elements of the system as described in this Section. The Dealer shall provide all warranty work and equipment upgrades as called for in this Section.

F) Dealer Services

1) Service shall be provided directly by the dealer and service visits shall be made within twenty four (24) hours of request.

2) Dealer shall maintain a 24-hour emergency service system. Upon owner contacting this system, return contact must be made within fifteen (15) minutes or less. Any dealer that does not supply a 24-hour service system must prove compliance and ability to supply emergency and after-hours service.

3) Dealer shall provide a single full-time on staff project manager from the outset through the completion of the project. This project manager shall be available for site meetings, site visits, phone meetings and any necessary functions relating to the successful completion of the project. This project manager shall be knowledgeable of all the equipment within the project and able to assist and troubleshoot challenges, either potential or realized, with the installing contractor when requested.

4) Dealer shall have on staff a minimum of one (1) ETCP certified member.

G) Subject to the above requirements, the equipment indicated herein shall be provided by the following dealers:

(1) Chicago Spotlight, Inc., Chicago, IL 312-455-1171
(2) Grand Stage Co., Chicago, IL 312- 332-5611
(3) Intelligent Lighting Creations, Arlington Heights, IL 847.933.9792
(4) Mainstage Theatrical Supply, Milwaukee, WI 414- 278-0878
(5)

Other dealers may be considered with prior review and approval of the Owner. Dealers seeking review must submit the following to the Owner not later than twenty (10) days prior to bid date:

(6) Dealer's name, location(s), business hours and contact information
(7) List of prior installations similar to this with date of installation, including:
    1. scope of installation
    2. lists of subcontractors
    3. value of installation
    4. complete owner contact information for each installation listed
    5. List of company ownership, including all partners and interested parties
    6. Copy of current and valid resale certificate
    7. Copy of standard Insurance Certificate
    8. Copy of Business License
    9. List of staff members, including certifications

6) PRIOR APPROVAL - SUBMITTALS

(1) The stage lighting and control equipment specified is called out in terms of products manufactured by Electronic Theatre Controls, Inc. The apparatus is fully cataloged and described with complete technical data available from the manufacturer. Bidders are advised that proposals embodying equipment of other manufacturers will automatically be rejected. Alternates will not be allowed for this project.

7) SUBMITTAL REVIEW AND APPROVAL

A) Four (4) sets of submittals including complete shop drawings shall be furnished for approval prior to fabrication of the equipment. A set of submittals shall be returned, appropriately marked, as the approval document. Each submittal set shall include:
    (1) Identification of qualified Theatrical Dealer providing system.
    (2) Theatrical Dealer shall indicate any additional wire or conduit runs not shown on the drawings that will be required to install Manufacturer's system.
    (3) Theatrical Dealer shall provide a schedule of quantities of dimmers, fixtures, color media, lamps, control equipment, and cables to be provided per schedules in drawings. If schedule of quantities is not provided with bid, the dealer will still be responsible for these quantities to make the space operational.
    (4) Qualification data for installer, dealer and manufacturer.
    (5) Coordination drawings including floor plans, showing dimensioned layout, required working clearances and required area above and around dimming equipment where piping and ducts are prohibited. Show rack layout and relationships between components and adjacent structural and mechanical elements.
    (6) Drawings showing all system assemblies and major sub-assemblies, cabinets and enclosures, including notation of type and manufacturer of switches, pilot lights, locks, hardware and electrical and electronic connectors.
    (7) Block Schematics of system internal wiring and system element interconnection.
    (8) Quantities of each component and sub-assembly.

8) OPERATION AND MAINTENANCE MANUALS

A) When the installation is complete, the owner shall be supplied with two (2) sets of Operation and Maintenance Manuals which shall include "as built" drawings and instructional videos. Maintenance information shall be provided on all major units and principal components of the system.

9) WARRANTIES

A) The manufacturer of the stage lighting and control equipment shall warranty the Stage Wiring Devices and Dimming and Control equipment to be free from defects of material or workmanship for a period of two years from the date of acceptance. During the period of this warranty, equipment which proves to be defective shall be repaired or replaced at no charge (excepting freight). Unauthorized local repairs of the equipment during the warranty period shall relieve the manufacturer of its responsibilities under this warranty.

B) UL/CE Labels: All items of equipment and individual components where applicable standards have been established shall be listed by the Underwriter's Laboratories, Inc. and the European Commission Conformity Standards and shall bear the UL and CE label when delivered and installed on the jobsite.

C) NEC Compliance: Equipment and Installation shall comply with the National Electrical Code (NFPA 101) as applicable to installation and construction of stage lighting and control equipment.

D) NEMA Compliance: Equipment shall comply with the standards of the National Electrical Manufacturers Association pertaining to components of stage lighting equipment.

E) ANSI Compliance: Theatrical Dealer shall provide electric lamps which comply with ANSI construction and rating standards.

F) Certificate of Installation: Theatrical Dealer shall submit certificates from the manufacturer's field engineer stating the installed system is operating properly and complies with manufacturer's recommendations.

10) PRODUCT DELIVERY, STORAGE AND HANDLING

A) Stage lighting equipment and controls shall be delivered securely wrapped in factory fabricated wooden or fiberboard type containers.

B) Equipment and controls shall be handled carefully to prevent breakage, denting and scoring finish. Damaged equipment and controls shall not be installed; damaged units shall be replaced and returned to equipment manufacturer.

C) Stage lighting equipment and controls shall be stored in clean dry spaces. They shall be stored in original cartons and protected from dirt, physical damage, weather and construction traffic.

11) LEED REQUIREMENTS

A) Within thirty (30) days after the date of system commissioning and sign off, record drawings of the actual installation shall be provided to the owner.

B) A minimum of 50% of stage lighting materials that are manufactured regionally within a radius of 500 miles shall be used.

**Part 2 – PRODUCTS**

2.1) GENERAL

A. All components shall be new, in original factory packaging, in new condition and under warranty.

B. All components shall bear UL/CE labels and labels identifying the manufacturer, model number and serial number. All such labels shall be permanently attached in a conspicuous location.

C. All control and receptacle faceplates not otherwise described elsewhere in this specification shall be black anodized aluminum or black painted steel with beveled edges and rounded corners. The minimum text height for all faceplates unless specifically specified elsewhere shall be ¼ inch.

D. Control signal protocol and connector types shall comply with current (as of the date of this specification) DMX-512 standards as set forth by the United States Institute for Theatre Technology

(USITT) and the Professional Light and Sound Association (PLASA). All control consoles shall be interchangeable.

E. All control, signal and video connectors shall be of substantial construction and shall be of the locking or latching type. All plate-mounted connectors shall be bolted to faceplates – rivets shall not be acceptable.

F. All components requiring external electrical connections of more than eight (8) conductors shall include barrier-type terminal strips properly sized and permanently labeled.

G. All keys for lockable devices shall be keyed identically by device type (i.e. control console, dimmer rack, entry panel, etc.). Provide a total of two keys for each keyed device.

2.2) PLUG CONNECTORS

A. Plug Connectors: 20A, Stage Pin 2 wire plus ground, with integral strain relief. Commonly referred to as 2P&G or slip-pin style plugs.

1. Male Plugs: Bates ; Pintech 2P&GM
2. Female Connectors: Bates ; Pintech 2P&GF
3. Flush Receptacles: Bates; Pintech 2P&GF-FL
4. Equivalent devices by Union Connector shall be acceptable

B. Quantities per lighting instrument specifications, cable specifications and schedules.

2.3) EQUIPMENT

A) DIMMER RACK

(1) General

1. The installation rack shall be the Sensor3 as manufactured by Electronic Theatre Controls, Inc., or equal. The fully digital dimmer rack shall consist of up to 48 dimmer module spaces. Sensor rack systems shall be UL Listed and CSA Approved, and shall be so labeled when delivered to job site.

(2) Electrical

1. Sensor racks shall operate at up to 120/208V, three phase, four wire + ground, 47 to 63 Hz at 800 amps max. Provisions shall be made for optional amp trap devices for fault current protection. Standard AIC fault current protection shall be 100,000.

2. All load and neutral terminals shall accept up to a #2 AWG wire.

(3) Electronics

1. Dimmer control electronics shall be contained in one plug-in Control Electronics Module (CEM+). Each CEM+ shall contain no discrete wire connections, and be housed in a formed steel body with an injection-molded face panel.

(4) Physical

1. The Sensor dimmer rack shall be a freestanding, deadfront switchboard, substantially framed and enclosed with 16-gauge, formed steel panels. All rack components shall be properly treated, primed and finished. Exterior surfaces shall be finished in fine texture, scratch resistant, gray epoxy paint. Removable top and bottom panels shall facilitate conduit termination on the 48-module rack. Knockouts shall serve the same purpose on 12 and 24 module racks.

2. Sensor racks shall be available in four sizes, with the following dimensions.

| | |
|---|---|
| SR3-6 (6 module) | 16.6”H x 14.8”W x 13.3”D |
| SR3-12 (12 module) | 25.8”H x 14.8”W x 13.3”D |
| SR3-24 (24 module) | 45.8”H x 14.8”W x 16.8”D |
| SR3-48 (48 module) | 83.1”H x 14.8”W x 22.8”D |

3. Racks shall be designed for front access to allow back-to-back or side-by-side installation.

4. Racks shall be designed to allow easy insertion and removal of all modules without the use of tools. Supports shall be provided for precise alignment of dimmer modules into power and signal connector blocks. With modules removed, racks shall provide clear front access to all load, neutral and control terminations. Racks that require removable panels to access load, neutral or control terminations shall not be acceptable.

5. An optional bus bar kit shall be available from the factory to allow adjacent racks to be powered by a single line feed. No hard, rack-to-rack wiring shall be required. Racks that require discrete cabling to connect adjacent racks shall not be acceptable.

6. Module spaces shall be mechanically keyed to accept only the module type (20A, 50A or 100A) specified for that space. Racks that allow modules of varying wattages to plug into the same space shall not be acceptable. The rack shall be configurable to accept mixed dimmer types and sizes throughout the rack.

7. Each rack shall provide a lockable full-height door containing an integral electrostatic air filter that shall be removable for easy cleaning. A single low-noise fan shall be located at the top of each rack. The fan shall draw all intake air through the integral electrostatic air filter, over the surfaces of the module housing and out the top of the rack. The fan shall maintain the temperature of all components at proper operating levels with dimmers under full load, provided the ambient temperature of the dimmer room does not exceed 40°C/104°F. Dimmer racks that do not employ both locking doors and electrostatic air filters shall not be acceptable. The fan shall turn on whenever any dimmer in the system is activated. In the event of an over-temperature condition, only the affected dimmer module(s) shall shut down and a message shall appear on the control module LCD. The fan shall remain on during thermal shutdown of individual dimmer modules.

8. An airflow sensor shall be provided. In the event of inadequate airflow, the affected rack shall shut down until the error is corrected.

9. If the ambient room temperature drops below 0°C/32°F or rises above 40° C/104°F, a warning shall appear on the dimmer rack LCD. If the temperature rises above 46°C/115°F, the rack shall shut down until the condition is corrected.

10. A 3 x .5-inch LED status indicator (beacon) shall be mounted in the rack door. The beacon shall be visible throughout a wide viewing angle. In normal operation conditions, this LED is illuminated. If the rack's control module senses an error condition, the beacon shall flash until the error is corrected. An optional indicator shall be available for remote locations.

B) CONTROL ELECTRONICS MODULE

A) General

(1) The dimmer rack electronics shall be contained in one plug-in Control Electronics Module (CEM3). Each control module shall plug into a dimming cabinet, with no discrete wire connections. A simple user interface shall be provided for group configuration, testing and diagnostics. The control module shall be UL/cUL Listed and CE Marked.

(2) The control module shall be completely digital without employing any digital-to-analog de-multiplexing schemes or analog ramping circuits.

B) Control Module Interface

(1) A backlit 7-button keypad and 2-line-by-20-character backlit LCD shall be provided for configuration, preset control, status and error indication as well as diagnostics.

(2) The seven buttons shall be Accept, Back, Plus, Minus, Home and Test as well as Reset.

(3) The front panel shall have four status LED indicators: a blue LED for power status and three green LEDs for Network, DMX A, and DMX B status.

C) Control Signal and Communications

(1) The control module shall be provided with an Ethernet control signal input. This input shall be fully configurable with a range of patching and priority programming capabilities. The Ethernet signal shall supply seamless integration between the dimmer racks and both the entertainment and architectural lighting control systems. The Ethernet signal shall also enable remote configuration, playback, file storage and monitoring features on a personal computer on the network.

(2) Two optically isolated DMX512 inputs shall also be provided, allowing overlapping or separation of any control level. 2,500V of optical isolation shall be provided between the DMX512 inputs and the electronics. Systems that do not have optical isolation on a prewired factory plug-in device shall not be acceptable.

(3) A single DMX512 input may be configured as a DMX output. The DMX out shall be capable of outputting DMX from data obtained from the Ethernet.

(4) The control module shall plug into an electronic backplane, with power, panic and station wiring connections available as screw terminals. DMX connections shall be available as either a screw terminal or a punch-down terminal. The Ethernet connection shall be a standard Cat5 RJ45 connection. The backplane shall also retain that specific rack’s configuration and preset data in non-volatile memory. When any new control module is inserted, it shall automatically come on-line fully functional.

(5) Complete group configuration containing rack setups, preset and dimmer information shall be stored in each control module. All data shall also be transferable to and from library storage on a personal computer on a group or per-rack basis. The system shall be capable of monitoring multiple racks on a single Ethernet connection.

D) Control Module Features

(1) The control module shall have a dimmer update rate better than 16ms (60HZ) or 20 ms (50 Hz) average. Dimmer outputs shall exhibit no oscillating or hunting for levels. Dimmers with the same choke type set to the same level shall output within ±1V of each other, regardless of phase or input voltage.

(2) Dimmer output levels shall be regulated for incoming line voltages. The regulation shall adjust for both RMS voltage changes and deformations in the incoming AC waveform. The control module shall monitor and adjust each dimmer's output to maintain a

constant power to the load. Regulation shall maintain the desired output voltage ±1V for the entire operating range (90-240V AC) with the exception that the maximum output will be no greater than the line voltage minus dimmer insulation loss. The regulation shall compensate for dips and anomalies in the AC waveform on a dimmer-by-dimmer basis. There shall be no interaction between dimmers in the system or any other equipment. The output shall be nominally regulated to 120V, but shall be field adjustable on a dimmer-by-dimmer basis to allow for varying cable length.

(3) The control module shall support a rack filled with different types and sizes of dimmer modules. The properties of each dimmer shall be configurable, including dimmer name, output curve, dimmer firing mode, and scale voltage values.

(4) The output curve selections shall include IES Modified Square, Square, Linear, Modified Linear and a Sensor v2.0 output curve. The control module shall also have the capability of storing up to three custom curves as well as an adjustable preheat level, assignable on a per-dimmer basis.

(5) The dimmer firing modes shall include: Normal (Dimmed), Dimmer Doubled, Switched (unregulated on/off with adjustable on-at level), Fluorescent with adjustable threshold, and Off.

(6) Dimmers set as Dimmer Doubled shall allow a single dimmer to set two different levels on one dimmer circuit by splitting the AC power into positive and negative half cycles with no resultant DC line current.

(7) The control module shall contain diagnostic routines to allow the user to test and troubleshoot the system. The control module shall also contain a Test/Bypass switch to turn all dimmers on to full for testing. This switch shall bypass all electronics and shall force the fan on.

(8) The control module shall be able to record up to 128 presets group-wide. Presets shall be user programmable by recording a snapshot of current dimmer levels (as set by the all control sources), by entering dimmer levels on the control module directly, or a combination of both methods. The system shall have the ability to program and activate group-wide presets from either the control module, a console or a networked computer or handheld device. Presets shall be activated in the default fade time of 2 seconds, but shall be have a user-programmable fade time between 0 and 60 minutes.

(9) In the event of data loss each rack shall maintain the last level for a user-programmable time of zero to five minutes or indefinitely, or may be programmed to fade out or to play a specific preset. Systems that do not offer this feature shall not be acceptable.

(10) A system-wide panic circuit shall be provided. Any dimmer in any rack may be assigned to the panic circuit. The panic may be set as momentary or maintained, normally open or closed, and shall have an option to force all non-panic dimmers to zero.

(11) DMX A and B as well as the Ethernet DMX (EDMX) data may be patched using a rack start address - assigned sequentially from a starting control channel or patched individually on a per-dimmer basis. Priority may be set per universe for the DMX inputs, and set per channel by the control source for the EDMX input. Each dimmer may have up to six network control inputs with either a highest takes precedence or priority patch. Each dimmer may also then be assigned to one of 4 rooms for additional specific preset control.

(12) The control module shall provide the ability to set a dimmer, all dimmers or a range of dimmers to a level.

(13) The control module shall be capable of monitoring and displaying incoming line voltage for all three phases on the LCD. With installed current sensors, the same display shall show amperage on each phase.

(14) English, French, German and Spanish language support shall be standard in the control module.

(15) The control module shall support 4 levels of security access. The user shall to able to program passwords that restrict access, preventing unauthorized use of higher-level functions by unauthorized personnel.

1. Level 4: Administrator - shall have full access
2. Level 3: Super User – shall be able to access by circuit number, change module and change rack types.
3. Level 2: User – shall be able to access by dimmer number
4. Level 1: Guest – shall be able to access “about” information

E) Standard Feedback:

(1) System and Rack messages shall include, but not be limited to, the following:

1. DMX port A or B has an error or has failed
2. Network has an error or has failed
3. Phase A, B or C is below 90 volts
4. Phase A, B or C is above 140 volts
5. Phase A, B or C did not start because it was below 90V or above 140V at power up
6. Phase A, B or C voltage headroom warning
7. Frequency is not 50 or 60 Hz
8. Rack shutting down due to air flow loss
9. Ambient temperature is below 0°C/32°F
10. Ambient temperature is above 40°C/104°F
11. Rack shutting down - ambient temperature exceeds 46°C/115°F
12. Configuration memory error

(2) About display shall allow monitoring of system, rack or dimmer status.

(3) About System shall provide information about Panic circuits, Preset looks, and System name.

(4) About Network shall provide IP address, gateway and net mask.

(5) About Rack General shall provide information about rack name, ambient temperature, air filters and rack type.

(6) About Rack Power shall provide information about power type, rack voltages, current per phase (only with current transformers), under voltage warnings.

(7) About Rack Data shall provide status for DMXA, DMXB, EDMX and Network activity.

(8) About Dimmer shall provide information about dimmer type, location, output level, control source, scale voltage, mode and curve.

F) Advanced Feedback:

(1) Sensor's Advanced Features (AF) option shall add an additional sensor in the individual dimmer modules. This option shall allow monitoring of current and output voltage on a dimmer-by-dimmer basis and provide information on lamp burnouts, dimmer status, and input voltages.

(2) The control module shall allow the user to record the loads of all AF dimmers in the system. The control module shall, during operation, test each AF dimmer, determine its

load, and compare it to the recorded load. Any change from recorded loads greater than five percent shall display an error on the control module and any monitoring device on the network.

G) Dimmer Specific messages shall include, but not be limited to, the following:
1. Load has dropped below recorded value
2. Load has raised above recorded value
3. DC detected on dimmer output
4. One SCR has failed on/off
5. Dimmer has failed off or circuit breaker has tripped
6. Dimmer has been removed
7. Dimmer load has failed
8. Dimmer has shut down due to over temperature
9. About Dimmer display shall provide additional information regarding the dimmer's recorded load and current or actual load.

H) Network Interface
(1) The Ethernet network shall provide an integral link to connect all racks in the system for rack-to-rack, rack-to-console and rack-to-network device communication.

(2) The network interface to the control module shall provide a number of user-programmable control logic schemes regulating the logical relationship between control sources, including architectural control.

(3) A technician shall be able to program all parameters onsite, via the facepanel or using a laptop personal computer. Systems that do not provide both types of user interface shall not be acceptable. These parameters shall include, but not be limited to, defining rack type, module type, scale voltage for each dimmer, firing mode, curve, dimmer numbering and DMX512 or network port assignments. Systems requiring factory programming shall not be acceptable.

I) Web-based Interface
(1) The control module shall incorporate web server technologies for interaction with standard web browsers. The Web interface shall provide an easy-to-navigate, graphical user interface for monitoring and control of the dimming systems. This interface shall duplicate all the functions of the control module.

(2) The web-based interface shall be self-contained, requiring no software installation on a user's computer. A user may use any laptop with a web browser to configure and exert basic control. A user shall be able to configure, monitor and control the dimming system using a web browser such as Internet Explorer 6.0 or higher. Use of standard web technologies shall also allow handheld computers, or PDA's, to access and control the system. Dimming systems that do not offer this facility shall not be acceptable.

J) Physical
(1) The control electronics shall be contained in one plug-in module, housed in a formed steel body with an injection-molded face panel, and self-retaining ejection handle to ease removal from the rack.

(2) The control module shall operate on a universal voltage range of 90 – 250V, single- or three-phase, 47 to 63 Hz. The control module shall automatically compensate for frequency variations during operation.

C) ARCHITECTURAL RACK ENCLOSURES

(1) The rack enclosure shall be the Unison DRd Series Control Enclosure as manufactured by Electronic Theatre Controls, Inc., or equal.

A) Mechanical

1) The Rack Enclosure shall be a surface mounted, deadfront switchboard, constructed of 18-guage formed steel panels with a hinged, lockable full-height door containing an integral electrostatic air filter.

a) Filter shall be removable for easy cleaning.

b) The enclosure shall support one control processor and one station power module plus accessories

c) The enclosure door shall have an opening to allow limited access to the control module face panel.

2) All rack components shall be properly treated and finished.

a) Exterior surfaces shall be finished in fine textured, scratch-resistant, epoxy paint.

3) The fully digital rack enclosure shall be available with six or twelve dimmer module spaces, one processor and a single station power supply, Rack dimensions and weights (without modules) shall not exceed:

| | | |
|---|---|---|
| DRd6 | 21.9” H x 17” W x 9.6” D | 38 lb. |
| DRd12 | 31.0" H x 17” W x 9.6” D | 51 lb. |

4) A single low-noise fan shall be located at the top of each rack. The fan shall draw all intake air through the integral electrostatic air filter, over the surfaces of the module housing and out the top of the rack.

a) The fan shall maintain the temperature of all components at proper operating levels with dimmers under full load, provided the ambient temperature of the dimmer room does not exceed 40°C/104°F.

b) In the event of an over-temperature condition, only the affected dimmer module(s) shall shut down. A red indicator LED will flash and an error message shall appear on the Control Processor.

5) Rack Enclosures shall be designed to allow easy insertion and removal of dimmer and control modules without the use of tools. (230 volt racks with CE certification shall require a screwdriver.)

a) Supports shall be provided for precise alignment of modules into power and signal connector blocks.

b) With modules removed, racks shall provide clear front access to all load, neutral and control wire terminations.

6) Rack Enclosures shall support use of any combination of rack option cards designed to provide additional rack features. Rack option cards shall include:

a) FLO - The Fluorescent Option Board shall provide termination for 4 wire low voltage electronic fluorescent dimming ballasts. FLO shall provide 24, 0-10Vdc outputs.

b) DALI - The DALI Option Board shall provide termination for DALI fluorescent dimming ballasts. DRd shall provide 24, DALI outputs for up to 63 ballasts each in a broadcast mode.

7) Optional floor mounting pedestal shall be available for the 12-module rack.

8) Racks enclosures shall be designed for use with AX series auxiliary racks for Main Circuit Breaker, Main Lug, and cross bussing applications.

B) Accessories

1) RideThru Option (RTO)
   a) The Rack Enclosure shall support an optional, short-term back-up power source for the control electronics.
   b) The short-term back-up power source shall automatically engage upon the loss of normal power, seamlessly transitioning the supply power for the control electronics power to itself.
   c) The short-term back-up power supply shall detect the return of normal power, and seamlessly return the control electronics to normal power.
   d) The short-term back-up power source shall support the control electronics for at least 10 seconds.

2) BatteryPack Option (BPO)
   a) The Rack Enclosure shall support an optional, long-term back-up power source for the control electronics.
   b) The long-term back-up power source shall automatically engage upon the loss of normal power, seamlessly transitioning the supply power for the control electronics power to itself.
   c) The long-term back-up power supply shall detect the return of normal power, and seamlessly return the control electronics to normal power.
   d) A test switch/indicator shall be available without opening the rack door or removal of any modules/components.
   e) The long-term back-up power source shall supply power to the control electronics for at least 90 minutes.

C) Electrical

1) Rack enclosures shall be available in 100, 120, 230, 240 and 277 volt, three-phase, main lug configurations.
   a) 120 volt rack enclosures shall be field configurable for single phase operation without the need for additional components

2) Rack enclosures shall be completely pre-wired by the manufacturer. The contractor shall provide input feed, load, and control wiring.

3) Standard Short Circuit Current Ratings (SCCR) shall be 22,000 at 100-277 Volt
   a) Higher SCCR ratings, up to 100,000 amps SCCR at 120V, shall be possible when used with an AX series Auxiliary Rack Enclosure.
   b) Higher SCCR ratings, up to 65,000 amps SCCR at 240V and 277V, shall be possible when used with an AX series Auxiliary Rack Enclosure.

4) All control wire connections shall be terminated via factory provided connectors.

5) Rack enclosures shall support dimming for incandescent, fluorescent, neon, cold cathode, electronic low voltage and magnetic low voltage transformer load types.

6) The rack enclosure shall support 16-bit DMX input

7) The rack enclosure shall support 65,000 steps of dimming.

8) The rack enclosure dimming engine shall support multiple dimmer curves including modified square law, linear, switched, fluorescent, pre-heat and electronic low voltage.

9) The rack enclosure shall support voltage regulation including, minimum and maximum scale voltages with offsets

10) Rack enclosure shall support a UL924 listed contact input for emergency lighting control bypass.
    a) Emergency lighting input shall support load shedding

11) Rack enclosures shall be designed to support the following wire terminations:
    a) AC
    b) Echelon link power (Belden 8471 or equivalent)
    c) 24Vdc (2- 16AWG Wire)
    d) DMX512A Port A (In or Out) (Belden 9729 or equivalent)
    e) DMX512A Port B (Out) (Belden 9729 or equivalent)
    f) RS232 Serial In/Out (Belden 9729 or equivalent)
    g) Unshielded Twisted Pair (UTP) Category 5/5e Ethernet
    h) Contact Closure In (14AWG to 26AWG Wire)
    i) Contact Closure Out (14AWG to 26AWG Wire)
        1) Contact Closure Out shall provide 1A @ 30vDC

12) Station Power Modules
    a) Station power modules shall provide LinkPower for up to 32 stations and 1.5A@24VDC of Auxiliary (AUX) power.
    b) Station power repeater modules shall provide LinkPower for 30 stations and1.5A@24VDC of Auxiliary (AUX) power.
    c) Station power module shall support over-current/short protection for LinkPower and Auxiliary (AUX) power. LinkPower shall support fault detection on each leg of the balanced data bus.

13) All control wire connections shall be terminated via factory provided connectors.

14) Main feed lugs shall accept a maximum of 350 MCM wire.

15) Load terminals shall accept a maximum of #6 AWG wire.

D) Thermal

1) Ambient room temperature: 0-40°C / 32-104°F

2) Ambient humidity: 10-90% non-condensing

D) ARCHITECTURAL CONTROL PROCESSOR MODULES

1) The Architectural Control Processor shall be the Unison Paradigm P-ACP Series Control Processor as manufactured by Electronic Theatre Controls, Inc., or equal.

2) The Architectural Control Processor (ACP) assembly shall be designed for use in DRd Series Dimming Enclosures and ERn Series Control Enclosures.

3) The processor shall utilize microprocessor based, solid state technology to provide multi-scene lighting and building control.

    a) ACP shall support functions such as station programming, macro sequencing, electronic lockout, room combine and astronomical time clock events. ACP station processor shall allow configuration of the control system via the menus. See software section for additional system details.

    b) When used in a dimming enclosure, the ACP shall allow access to dimming control menus including the status screen, dimming configuration screen, backup menu, test menu and configuration menu.

4) One ACP shall be rated to drive 1024 channels of control, 1024 zones, 64 rooms, 512 presets, 62 button or button/fader stations and 6 Touchscreen Stations

5) ACP module electronics shall be convection cooled.

6) The ACP shall provide front-panel RJ45 jack, Secure Digital (SD) card slot, and Universal Serial Bus (USB) Port for configuration and data exchange.

7) Architectural Lighting System configuration and program information shall be stored in flash memory, which does not require battery backup.

8) The ACP shall be contained in a plug-in assembly and require no discrete wiring connections; all wiring shall be terminated into Dimming or Control Enclosure.

    a) The ACP shall support the following communications:

        1) Echelon LinkPower

        2) 10/100BaseTX, auto MDI/MDIX, 802.3af compliant Ethernet networking with TCP/IP, ESTA BSR E1.17 Advanced Control Networks (ACN) and ESTA BSR E1.31 (sACN) Protocols

        3) EIA-232 serial protocol

        4) ESTA DMX512A, configurable as input or output ports

        5) Dry contact closure inputs

        6) Dry contact closure outputs, rated at 1A@30VDC

E) DIMMER MODULES

A) General

(1) The dimmer modules shall be the Sensor dimmer modules as manufactured by Electronic Theatre Controls, Inc., or equal. Sensor dimmer modules shall be designed for dependable, economical service in theatrical and video applications.

B) Electrical

(1) Each dimmer module shall contain two single-pole circuit breakers, a solid-state switching module, associated toroidal filters, and power and control connectors.

(2) Modules shall not have any protruding pins subject to physical damage when the module is not installed.

(3) Modules shall be keyed so that dimmer modules of different capacity shall not be interchangeable.

(4) Circuit breakers shall be fully magnetic so the trip current is not affected by ambient temperature. Circuit breakers shall be rated for tungsten loads having an inrush rating of no less than 20 times normal current. Circuit breakers shall be rated for 100 percent switching duty applications. Dimmers that do not operate continuously at 100% load shall not be acceptable.

C) SCR Assembly

(1) Each dimmer module shall use a solid state module (SSM) consisting of two silicon-controlled rectifiers (SCRs) in an inverse parallel configuration, and all required gating circuitry on the high voltage side of an integral, opto-coupled control voltage isolator. Rectifiers, copper leads and a ceramic substrate shall be reflow soldered to an integral heat sink for maximum heat dissipation. The SSM shall also contain a control LED, a thermistor for temperature sensing, and silver-plated control and load contacts. The entire SSM shall be sealed in a plastic housing requiring only a screwdriver to replace. Dimmers employing triac power devices, pulse transformers, or other isolating devices not providing at least 2,500V RMS isolation, shall not be acceptable. Dimmer modules requiring disassembly, heat sink grease or additional tools for repair shall not be acceptable.

(2) All electronic components (current/voltage sensors and indicators) shall be contained in a single, field-replaceable housing. Modules requiring discrete wiring of electronic components shall not be acceptable.

(3) SCR power switching devices shall have the following minimum ratings:

| | | |
|---|---|---|
| F) Module Size: | G) 15A | H) 20A |
| I) Single cycle: Peak surge current | J) 625A | K) 625A |
| L) Half cycle: 12T | M) 1,620 | N) 1,620 |
| O) Transient over voltage | P) 600V | Q) 600V |
| R) Die size (in) | S) .257 | T) .257 |

A) Filtering

(1) Dimmer modules shall include toroidal filters to reduce the rate of current rise time resulting from switching the SCRs. The filter shall limit objectionable harmonics, reduce lamp filament sing and limit radio frequency interference on line and load conductors. Modules shall offer 350 or 500 uS. filter rise times. Rise time shall be measured at the worst case slew rate (about 50 percent) from 10 to 90 percent of the output wave form with the dimmer operating at full load.

(2) All dimmers shall maintain their published rise time and/or fall time regardless of duty cycle or rack temperatures. Dimmers that derate due to increased dimmer temperature caused by full load operation or high phase angles shall not be acceptable.

B) Performance

(1) Power efficiency for standard dimmers shall be at least 97 percent at full load with a no-load loss of 3V RMS. The dimmer shall accept hot patching of a cold incandescent load up to the full rated capacity of the dimmer.

C) Physical

(1) Dimmer modules shall be fully plug-in and factory wired. Dimmer modules shall consist of a heavy duty, die-cast aluminum chassis with integral face panel. No tools shall be required for module removal and insertion. All parts shall be properly treated, primed and finished in fine-texture, scratch resistant, gray epoxy powder coat. With the exception of the circuit breaker, the module shall contain no moving parts. Each module shall be labeled with the manufacturer's name, catalog number and rating. Modules constructed of molded plastic for structural support are not equivalent and are not acceptable. Dimmer modules shall be UL Recognized.

12) LINEAR DIMMER BAR

A) General

(1) The dimmer bar shall be the SmartBar 2 as manufactured by Electronic Theatre Controls, Inc., or equal. SmartBars shall be portable linear forward-phase (SCR) dimmer bars that allow fixtures to be mounted on them. The SmartBars shall be available with current ratings of maximum 10 Amps per output circuit for a maximum of 20 Amps per incoming phase of power.

(2) Installation requires attachment for suspension points, safety cables, local main power via a flexible cable, and DMX signal input.

(3) SmartBars shall be UL Listed and cUL Approved, and shall be so labeled when delivered.

U) Mechanical

1) The dimmer bar shall be a self-contained unit, suitable for portable or permanent installation. It shall be constructed of aircraft quality powder coated aluminum.

2) All dimmer bars shall be convection cooled and shall operate without cooling fans or filters.

3) The bar shall have integrated suspension points for fixtures and for mounting hardware(c-clamps or stand adapters). It shall be supplied with five 4-1/2” long, ½” bolts and appropriate hardware.

4) Integrated suspension points shall provide captive nylon bushings for ease of swivel focus of fixtures after mounting bolts have been tightened.

5) The 2 circuit dimmer bar shall measure 3.0 x 2.0 x 40 inches and weigh no more than 14 lbs. The 4 circuit dimmer bar shall measure 3.0 x 2.0 x 60 inches and weigh

no more than 18 lbs. The 6 circuit dimmer bar shall measure 3.0 x 2.0 x 88 inches and weigh no more than 28 lbs.

V) Electrical

1) Power wiring to each module shall be connected by use of a 12' flexible SO Top or bottom fed cord and connector. Use of flexible feed cords and connectors facilitates the reconfiguration of both permanent and portable dimming equipment installations Each bar shall be powered by a power feed service according to its current rating.
2) 2, or 4 circuit: Single phase 2-wire plus ground, 20A feed
3) 6 circuit: Three phase 4-wire plus ground, 20A feed
4) Alternately High Power versions of the 4 and 6 circuit bars: Single phase 3-wire plus ground, 20A feed
5) Fully magnetic circuit breakers shall be used for load protection.
6) Output connectors shall be available as Stage Pin, Dual Edison (Parallel Blade with Ground) or Grounded Twist-Lok outlets.
7) A single duplex outlet shall be provided as a convenience power outlet.

W) Control

1) The front panel shall contain DMX512 Input and Thru connectors. The module shall support up to 32 Power Modules on one DMX line
2) The Bar shall support ANSI E1.20 Remote Device management (RDM).
3) Dimmer control electronics shall be contained within the dimmer bar. The electronics shall include the following indicators and controls:
4) Two status LED indicators: Power and Valid DMX
5) 2-line by 20-character backlit LCD for system configuration, status display and error indication
6) 6-button keypad with arrow array which includes Enter button
7) The electronics shall provide flexible programming of individual dimmer characteristics:
   a) Local control or live manual control
   b) 20 pre-programmed chase sequences
   c) Selection of standard Dimmer Curves
   d) RDM programmable DMX patch
   e) RDM Identification
   f) Minimum levels
   g) Non-dim operation

X) Thermal

1) All units shall be convection cooled and shall operate without cooling fans or filters. The pack shall operate safely in an environment having an ambient temperature

between 32ºF (0ºC) and 104ºF (40°C), and humidity between 10 - 90% (non-condensing).

2) Optimum cooling shall be when the units are mounted horizontally with the control panel vertical (or upright).

2) CONTROL EQUIPMENT RACK

A) General

1) The control equipment rack shall be a standard 19” equipment rack, such as manufactured by Middle Atlantic Products and based on the EWR style with separate wiring backpan. This rack shall house the control equipment necessary to complete the system functions and configuration.

2) The equipment housed in the control equipment rack shall be, but is not limited to, the network switch, the network patch, any network conversion device, any data distribution device and any data conversion device that is necessary for the function and completion of the system as a whole.

3) The specific equipment required is to be notated and shown on the drawings and contained in the schedule of quantities.

3) LIGHTING CONSOLE AND ACCESSORIES

A) General

(1) The lighting control console shall be a microprocessor-based system specifically designed to provide complete control of stage, studio, and entertainment lighting systems. The console shall be the Element as manufactured by Electronic Theatre Controls, Inc., or equal.

(2) The control system shall be Net3 and ETCNet2 native, with both protocols output simultaneously over the network. The system shall also be able to control third party ACN devices directly. The system shall provide control of 1024 outputs on 250 or 500 channels.

(3) A maximum of 10,000 cues, 1000 groups, 1000 Intensity Palettes, 1000 Color Palettes, 1000 Focus Palettes, 1000 Beam Palettes, 1000 effects, 1000 macros and 100 curves may be contained in non-volatile electronic memory and stored to an onboard hard disk or to any USB storage device.

(4) The console may be placed in Tracking or Cue Only mode by the user as a system default and overridden on individual record actions as required.

(5) A Master Playback fader pair and dedicated Grand Master/Blackout shall be provided.

(6) The console shall provide 40 or 60 pageable faders and bump keys that may be operated in either LTP channel or HTP/LTP submaster mode. The console shall support a total of 300 submasters.

(7) A high-resolution level wheel shall be provided to control intensity for selected channels and scrolling within selected displays. On demand moving light controls shall be provided for control of other non-intensity parameters. Non-intensity parameters shall be controllable via the on demand or keypad controls.

(8) On demand moving light controls shall provide mouse-based tools for non-intensity parameters. The tools shall display the current value for each parameter and shall provide controls for adjusting each parameter.

(9) Control and programming features for automated fixtures shall also include: a standard library of fixture profiles, the ability to copy and edit existing profiles and create new profiles, patch displays including channel and output addressing, 16-bit fade resolution, color characterization allowing color mixing and storing in Hue and Saturation or native device values.

(10) System information, including playback status, live output and blind values for all record targets shall be displayed on a maximum of two external high resolution DVI monitors, or one SVGA monitor, which may also be touch-screen(s). Only one display shall be required for operation.

(11) The system shall direct user input through on-screen dynamic prompts and integral LEDs on console keys indicating current operating mode. A context sensitive on-line Help feature shall explain and provide an example of the operation of each feature of the system.

(12) An optional, fully-functioning, detachable alphanumeric keyboard shall be supported. The keyboard shall allow labeling of channels, cues, presets, groups, palettes, effects, macros, curves and the show. An integral electronic keyboard shall be provided.

(13) A row of softkeys shall be provided, which change function based on the selection and context of the console. These softkeys shall be labeled on the connected external display.

(14) Console software upgrades shall be made by the user via a USB port; changing internal components shall not be required.

(15) The console operating software shall be loaded into program execution memory from the internal hard drive when the console is powered. In the event of an uncontrolled shutdown, the console shall return to its last output state when power is restored.

(16) Show data may be created and modified on a personal computer, using either Windows XP or Windows 7 operating systems, using a free offline editing application. The offline editor may also run natively on Macintosh platforms using OS X.

(17) A PC, using Windows XP, Windows 7, or a Macintosh computer running OS X, running a client software application shall be able to connect to a control system via the network and view current show data in a mirrored display environment.

(18) The system shall allow remote control from a purpose-built wireless remote focus unit (Radio Focus Remote). Systems without these remote control devices shall not be acceptable.

(19) The system shall support a Telephone remote control that allows basic functions to be controlled from a standard wireless phone producing touch-tone signals. This allows the use of a standard telephone for a low cost remote control. Systems that do not allow this function shall not be acceptable.

(20) The system shall support up to 32 individual Time Code Event lists.

B) Controls and Playback

(1) Manual Control and Programming Section

1. The console keyboard shall be grouped by function. Major groupings shall be record target functions, numeric keys, level assignment functions, display navigation functions and controls.

2. Non-intensity parameters may be set numerically or via the on demand moving light controls. This control shall be fully interactive. In either case the current parameter value shall be displayed on the console monitor.

3. Only those parameters available for control in the active lighting system shall be displayed for control.

4. Lamp controls provide direct access to luminaire functions such as striking and dousing arc lamps and calibrating entire fixtures or individual mechanisms of fixtures, as provided by the luminaire manufacturer. User access to these features is normalized across all manufacturers for ease of use. Use of a "control channel" for accessing these functions shall not be required and systems requiring use of a control channel shall not be acceptable.

5. Fixtures with CMY or RBG color mixing may be set with direct CMY or RBG controls, as well as the Hue and Saturation controls and/or color picker. Color may also be set directly to a gel match, normalized to 3200K.

(2) Playback Section

1. The master fader shall consist of a 60mm Master Fader pair with associated Load, Go and Stop/Back buttons.

2. It shall be possible to instantaneously halt an active cue, go back to the previous cue, manually override the intensity fade or manually override the entire fade.

(3) Integral Channel/Submaster Faders

1. Submaster and fader support shall be provided via 40 or 60 integral 45mm faders with bump leys. These faders shall be pageable and shall operate in LTP channel and LTP/HTP submaster modes.

2. LTP channel mode shall allow the user access to intensity of the first 120 channels and shall operate with LTP logic. Faders that are not currently set to the same level as the corresponding channel shall have to be matched to that level before affecting said channel.

3. Up to 240 proportional, fully overlapping additive or inhibitive submasters may be defined. Submasters shall have colored LEDs to indicate submaster status. Each submaster may have fade up, dwell and down fade times. Each has a bump and assert/channel select button. Submasters may be set to independent, exclusive and proportional/intensity master control.

4. The submaster blind buffer shall be linked directly to live playback allowing live editing of live submaster content via the command line.

5. It shall be possible to set submaster values directly from the command line.

(4) Grand Master

1. A dedicated 60mm grand master and blackout button are provided.

2. The grand master shall proportionally fade intensity values to zero. Blackout shall send all intensity outputs to zero. Non-intensity outputs shall not be affected. No additional configuration shall be required to withhold non-intensity values from Grand Master and Blackout control.

(5) Display Controls

1. Format shall change the view of selected displays.

2. Channel views may be displayed either in a expanded table view combining conventional channel symbols with table views for multi-parameter devices, or in a channel summary view.

3. Flexi channel shall change which channels are viewed in selected displays, based on a variety of different criteria, including all channels, patched channels, active/move channels, manual channels, selected channels and user-specified channel lists.

4. Expand shall extend the selected view sequentially across connected displays.

5. Data shall display absolute values of referenced data.

Operating Modes

(6) Live Mode

1. Channel lists may be constructed using the +, - and Thru keys.
2. Levels may be set with the keypad, level wheel and on demand moving light controls. “Selected” channels shall be those last addressed and under keypad control.

3. Sneak shall be used to restore specified channels to background states, default values, or to send them to specified values, in user specified or default times.

4. Selected channels may be set at a level or held to current values while all other channels are set to zero using Rem Dim. Toggling Rem Dim shall restore all unselected channels to original levels. The Rem Dim level shall be user definable.

5. Channels may be recorded into groups for fast recall of commonly used channels. 1000 groups shall be available. Groups shall store selection order. The Offset function supports rapid creation of ordered groups, including reverse and random order.

6. Parameter settings may be stored to Focus and Color Palettes. All referenced data may be stored to whole numbers or to up to 99 decimal places between each whole number. It shall be possible to store 1000 of each palette type.

7. Any collection of channel data, as determined by the use of “Record” or selective store commands may be stored to palettes (as appropriate to the type).

8. The following conditions may be placed on a channel or channel parameter to be included with a cue record action.
    1. Block flag
    2. Note

9. Cues may be recorded in any order. Up to 99 decimal cues may be inserted between any two whole number cues. Each cue may contain a maximum of twenty parts. Parameters may be automatically assigned to specific parts or assigned when the part is created.

10. It shall be possible to record cues and cue parts with the following information:

11. Any collection of channel data, as determined by the use of “Record” or selective store commands.

12. Cue Level timing and delays for Intensity Up and Intensity Down, Parameter moves shall follow the Intensity Up time.
    1. Follow or hang time
    2. Link instruction
    3. Loop value
    4. Block and/or preheat
    5. Curve
    6. Label and note
    7. Execute list to trigger other activity

13. Non-intensity channel parameters may be marked (preset using Automark. Automark presets any parameter transitions in the cue just prior to intensity becoming active. Automark may be disabled on a cue or cue part basis, enabling a “live” move.

14. Any channel parameter may be stored with an effect instruction. These effects may contain relative offsets from current value, or absolute instructions. Effects may be progressive action or on/off states. Entry and exit behaviors shall modify the channel parameters activity when beginning and ending the effect.

15. Update may be used to selectively add modified parameter data quickly to that parameter’s current source. It shall be possible to update inactive record targets. It shall also be possible to update back to the current source of the move instruction without specifying that cue via Trace.

16. Recall From quickly pulls specified data from record targets into the current view.

17. Copy To quickly copies selected data to specified record targets.

18. Address and channel check functions shall be provided.

19. Channel parameters may be “parked” at levels. Output addresses may also be parted directly. Parked levels shall not be added to any live record operations, nor may they be changed until the parked element is “unparked”. Address park shall also be provided.

20. About shall provide detailed status of selected channels or specified record targets, including utilization information. About shall also access lamp control functions to calibrate devices, strike and douse arc sources. Use of a luminaire control channel for these functions shall not be acceptable.

21. Live data may be displayed in an expanded table view containing conventional symbols and table views for multi-parameter devices or in a summary view.

22. Undo shall be used to sequentially step back through manual operations, record, update and delete actions. Redo functions shall be provided. Multiple undo commands may be executed at once.

23. Home shall set selected channels non-intensity parameters to their default values.

24. Move shall allow all show data to be moved from one record target to another.

(7) Blind

1. The Blind display allows viewing and modification of all record targets without affecting stage levels.

2. Record target data may be displayed in an expanded table view containing conventional symbols and table views for multi-parameter devices, in a summary view or a spreadsheet view, which allows quick data comparisons, move and replace with functions.

3. Changes made in blind displays shall be stored automatically.

4. Blind editing shall be possible for all record targets.

5. It shall be possible to show or hide parameter data in spreadsheet views for simplicity in viewing/editing.

(8) Patch Display

1. Patch shall be used to display and modify the system control channels with their associated library data.

2. Each channel may be provided with a proportional patch level, preheat, curve, label, swap and invert functions.

3. Offset functions in patch shall allow selection of channel ranges and shall allow the user to establish a “custom” footprint for any device output.

4. Custom color wheels, color scrolls and gobo wheels shall be defined in patch. These devices shall be created with a simple table and graphical user interface supported by images of major manufacturers.

5. Copy to and Move functions shall be supported in patch.

(9) Setup/Browser

1. Setup shall access system, show and desk configurations.

2. The browser shall access show data storage, import, export, print to .pdf and clear functions, as well as show data utilities.

(10) Interface Options

1. The console shall support a variety of local interfaces.

2. AC input.

3. USB ( a minimum of five ports shall be provided for connecting devices such as a Alphanumeric keyboard, mouse, touch screens, USB Flash drive, etc.) The desk shall provide at least four ports on the rear of the console and one on the control surface itself

4. Ethernet (one port) 802.3af compliant.

5. Two DVI video output connectors, supporting a maximum of two DVI monitors at 1280x1024 resolution minimum.

6. One VGA output connector.

7. Accessories
    1. Net3 Radio Focus Remote
    2. iRFR an iRFR Preview (applications for iPhone, IPod Touch and iPad)
    3. Net3 Remote Video Interface
    4. Net 3 Gateways
    5. Net3/ETCNet2 to DMX/RDM Gateways (one to four ports)

6. MIDI/SMPTE Gateways
7. I/O Gateway with 12 analog inputs, 12 SPDT contact outputs, RD232 interface
8. Element Client Software Kit

C) Physical

(1) All operator controls and console electronics for a standard system shall be housed in a single desktop console, not to exceed 32.9” wide, 17.9” deep, 5.1” high, weighing 30 pounds.

(2) Console power shall be 95 – 240V AC at 50 or 60Hz, supplied via a detachable power cord.

D) DMX ETHERNET GATEWAY – ONE PORT

(a) General

(1) The lighting control gateway shall be a microprocessor-based unit specifically designed to provide DMX-512 control of lighting. The gateway shall permit DMX-512 data to be encoded, routed over an Ethernet network and decoded back to DMX-512. The unit shall be a Net3 DMX 1-port Gateway as provided by ETC, Inc.

(2) Gateways shall communicate over Ethernet directly with at least ETC, Inc.’s entertainment and architectural lighting control products and other Ethernet interfaces.

(3) Connections shall be made between gateways, consoles, architectural systems, and PCs over standard Ethernet distribution systems using 10/100BaseT.The gateway shall support multiple protocols including:

(a) ANSI E1.31 Streaming ACN (sACN)
(b) ANSI E1.11 USITT DMX512-A
(c) ETCNet2 protocol suite
(d) ETCNet protocol suite

(4) The gateway shall be tested to UL standards and labeled ETL Listed.

(5) The gateway shall be RoHS Compliant (lead-free).

(6) The gateway shall be CE compliant.

(7) The gateway shall be configurable using Network Configuration Editor (NCE) software.

(8) Each gateway shall have power and network activity LEDs

B) DMX Ports

(1) DMX Port shall comply with the requirements of ANSI E1.11 USITT DMX512-A standards.

(2) The DMX port shall be software-configurable for either input or output functionality.

(3) Hardware configuration override setting shall be provided on the gateway.

(4) DMX input shall be optically-isolated from the gateway electronics.

(5) DMX output shall be earth-ground referenced.

(6) DMX Port shall be capable of withstanding fault voltages of up to 250vAC without damage.

(7) Each port shall incorporate one DMX512-A Connection

(a) Each DMX port location shall support a single 5-pin male XLR or 5-pin female XLR

(8) Network gateways that do not indicate input/ output port configuration or presence of valid data shall not be accepted

C) Processor

1) Maximum delay time from input to output shall not be greater than one packet time (approximately 22 mSec.).

2) A minimum DMX update rate of 40Hz shall be sustained under all conditions unless specifically configured for a slower rate for the sake of compatibility with 3rd party DMX devices.

D) Mechanical

1) The gateway faceplate shall be constructed of durable cast aluminum and mount in a standard 1 gang backbox. Faceplates manufactured of plastic shall not be acceptable.

2) Gateways shall be provided in matte black powder coat finish.

3) The gateway shall be available in two versions

a) Wall mount gateway

1) The wall mount gateway shall support flush or surface mount applications using a standard RACO 690 backbox or equivalent.

2) Dimensions shall not be more than 2.75” (70mm) wide x 4.5” (115mm) High

3) Wall mount gateways shall not weigh more than.35 lbs (.16kgs)

b) Touring gateway

1) The touring gateway shall include a complete enclosure with Ethercon and power connectors for wiring terminations

2) Dimensions shall not be more than 4.5” wide (115mm) x 3.5” (89mm) deep x 6.34” (161mm) high (not including mounting hardware)

3) Touring gateways shall not weigh more than 2.5 lbs (1.1 kg).

E) Power

1) Power for the gateway shall be provided either over the Category 5 (or better) cable, utilizing IEEE 802.3af compliant Power over Ethernet distribution equipment. Power consumption shall not be greater than 5 watts.

2) The gateway electronics shall be electrically isolated from the power supplied over the Catagory5 (or better) cable.

3) Power may be provided from any IEEE 802.3af compliant power-over Ethernet distribution equipment, or by using conventional switches together with isolated in-line power supplies as provided by gateway manufacturer.

F) Configuration

1) Each gateway on the network shall be individually configurable using Network Configuration Editor (NCE), running on a network connected PC. The PC shall only be required for configuration, and shall not be required for normal operation of the system.

2) Each DMX gateway shall control up to 512 DMX addresses. The specific DMX data input or output by the gateway shall be freely configurable by the user. Duplicate outputs of DMX lines (DMX splitter) and discrete outputs shall be fully supported.

3) Multiple sACN sources may be combined with a priority may be assigned to each source sending data to the gateway.

G) Network

1) Communications physical layer shall comply with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet specifications.

2) All network cabling shall be Category 5 (or better), conforming to TIA-568A/B, and shall be installed by a qualified network installer.

3) Data transport shall utilize the TCP/IP suite of protocols to transfer the DMX data.

4) ANSI E1.31 streaming ACN (sACN) shall be supported. Gateways that do not support ANSI E1.31 shall not be acceptable.

5) Switches shall comply with power-over-Ethernet IEEE802.3af, unless a separate in-line power supply is provided.

6) Each DMX gateway shall control up to 512 DMX addresses, per DMX port within the confines of up to 63,399 universes (32,767,488 addresses) when using Streaming ACN (sACN) and 64 DMX universes (32,767 addresses) when using EDMX.

7) Multiple sources shall be supported by prioritized Highest Takes Precedence (HTP with priority). Each source shall support assignment of priority to allow override of default HTP behavior.

8) Each DMX port shall support its own universe and start address.

9) Gateways shall support built in priority on a per-universe or channel-by-channel basis. Gateways that do not support prioritized merging of multiple network sources at independent channel priorities shall not be accepted.

H) Environmental

1) The ambient operating temperature shall be 0° to 40°C (32° to 104°F).

2) The storage temperature shall be -40° to 70°C (-40° to 158°F).

3) The operating humidity shall be 5% - 95% non-condensing.

I) Accessories

1) Hanging bracket kit shall allow gateway to be mounted using C-Clamp to U-bolt Hardware.

2) ETC Network Configuration Editor (NCE) software

J) System Requirements

1) Provide the quantity and type of gateways required, as scheduled. Gateways and software shall be as manufactured by Electronic Theatre Controls Inc. of Middleton, WI.

2) Provide Ethernet switches and power supplies as scheduled and as shown on drawings.

3) Provide a current generation PC with Windows XP operating system equipped with a 10/100 Ethernet card.

4) Systems that do not provide the above capabilities shall not be acceptable

4) DATA PLUG-IN STATIONS

A) General

1) The Plug-in Stations shall consist of the appropriate connectors required for the functional intent of the system. These stations shall be available with DMX input or output, Remote Focus Unit, Network, or architectural control connectors. Custom control connectors shall be available.

B) Connector Options

1) The following standard components shall be available for Plug-in Stations:
   a) 5-Pin male XLR connectors for DMX input
   b) 5-Pin female XLR connectors for DMX output
   c) 6-Pin female XLR connectors for RFU and ETCLink connections
   d) RJ45 connectors for Network connections - Twisted Pair
   e) 6-Pin female DIN connectors for Unison connections
   f) DB9 female serial connector for ARCHITECTURAL control from a computer

2) Custom combinations and custom control connections shall be available.

C) Physical

1) Station faceplates shall be .80” aluminum, finished in fine texture, scratch-resistant black powder coat. Silk-screened graphics shall be white.

2) The station panel shall mount into an industry standard back box, depending on size and quantity of connectors. A terminal block shall be supplied for contractor terminations.

5) PORTABLE TOUCHSCREEN CONTROL STATIONS

A) The Portable Touchscreen Control Stations shall be the Unison Paradigm Portable Touchscreen P-LCD Series Control Stations as manufactured by Electronic Theatre Controls, Inc., or equal.

1) General

a) Portable Touchscreen stations shall support default and fully graphical control pages.

b) Portable Touchscreen stations shall operate using graphic buttons, faders and other images on at least 30 separate programmable control pages.

c) Portable Touchscreen stations shall also allow programming of page pass-code, lock out and visibility levels.

d) Portable Touchscreen stations shall support location awareness to automatically load the configuration required dependant on the connection point to the system

2) Mechanical

a) Portable Touchscreen stations shall consist of a seven inch, backlit liquid crystal display (LCD) with a minimum resolution of 800 by 400 pixels and 24-bit color depth with a touch interface.

b) The Portable Touchscreen enclosure and cover shall be constructed of aluminum and finished in a fine-texture powder coat paint

c) The enclosure shall provide a hinged cover with two positions for the Touchscreen: closed and operating.

d) The Portable Touchscreen shall have a protective cover for removable media ports.

e) The protective cover shall be hinged

f) The Touchscreen cover shall be operational with the media cover in the open or closed position

g) The Portable Touchscreen shall include an attached cable with 6-pin Amphenol connector and strain relief to interface with Portable Connector Stations

h) Attached Cable shall be 15' in length constructed of ultra-flexible material

i) Extension cables up to 100' in length shall be available to extend the cable length to a maximum of 115' total length

3) Electrical

a) Portable Touchscreens shall be powered entirely by the System network.

b) Portable Touchscreens shall connect to the System using the Unison control station Echelon® Link power network over the attached cable.

c) Echelon® Link power network.

1) Link power shall utilize low-voltage Class II unshielded twisted pair, type Belden 8471 or equivalent, and one #14 ESD drain wire (when not installed in grounded metal conduit).
2) Touchscreen stations shall also require (2) #16 AWG stranded wires for 24Vdc operating power. 24Vdc wiring shall be topology free.
3) Network wiring may be bus, loop, home run, star or any combination of these.

4) Functional

a) System

1) The Portable Touchscreen shall support configuration upload from a Paradigm Processor as proxy
2) The Touchscreen shall support configuration or firmware upload from local removable media
3) It shall be possible to connect multiple Portable Touchscreen station to the system at one time

b) Setup Mode

1) There shall be a setup display that is separate from any user-defined configuration

2) It shall be possible to view and modify connectivity settings
3) It shall be possible to view status information
4) It shall be possible to view and modify LCD screen settings
5) It shall be possible to perform Touchscreen calibration
6) It shall be possible to view and modify audio settings
7) The appearance of the setup display shall be standard and not editable
8) The setup display may be invoked from within the user-defined configuration and/or physical button on the Portable Touchscreen
9) There shall be a default protected method to invoke the setup display

c) Configurations
1) It shall be possible to have multiple configurations stored within an LCD Station
2) The Portable Touchscreen shall automatically load the required configuration based on connection point to the system
3) Only one configuration may be active on the LCD Station
4) It shall be possible for Portable Touchscreen Stations connected via the Echelon® Link power network to select a configuration automatically based on the configuration of the physical connection.
5) Where multiple configurations are stored there shall be a setup menu to allow selection of a configuration
6) Each configuration shall be identified as a different Station within the System

d) Operation
1) The Unison Paradigm Control System shall be designed to allow control of lighting and associated systems via Touchscreen controls. System shall allow the control of presets, sequences, macros and time clock events.
A) System presets shall be programmable via Button, Button/Fader or Touchscreen stations, or LightDesigner software.
B) Presets shall have a discrete fade time, programmable from zero to 84,600 seconds with a resolution of one hundred milliseconds.
C) Presets shall be selectable via Touchscreen stations.
2) System macros and sequences shall be programmable via LightDesigner system software.
A) Macro and sequence steps shall provide user selectable steps, and allow the application of conditional logic.
B) Macro and sequences shall be activated by button, time clock event or LightDesigner software.
3) System time clock events shall be programmable via the Touchscreen, LightDesigner system software, the processor user interface, or the internal web server.

A) Time clock events shall be assigned to system day types. Standard day types include: anyway, weekday, weekend, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday and Saturday. System shall support programming of additional custom or special day types.

B) Time clock events shall be activated based on sunrise, sunset, time of day or periodic event. System shall automatically compensate for regions using a fully configurable daylight saving time.

4) A Color picker, supporting Hue, Saturation and Brightness (HSB) color selection shall be available for color selection of color changing fixtures and provide visual feedback of the current color produced by the associated fixture.

A) The color picker shall be provided with a default layout that requires no user configuration

B) The Color Picker shall provide RGB faders in addition to the default HSB color wheel for color selection

C) Color picker values shall allow for numerical value input in addition to color wheel and fader control

D) The color picker shall be compatible with color mixing systems that use up to seven discrete color control channels

5) Portable Touchscreen stations shall be designed to operate standard default or custom system functions. Components shall operate default functions unless re-assigned via LightDesigner, the Windows-based configuration program.

A) Optional button functions include: preset selection, manual mode activation, record mode activation, station lockout, raise, lower, macro activation, and cue light, or room join/separate.

B) Optional fader functions include master control, individual channel control, fade rate control or preset master control.

6) Portable Touchscreen stations shall allow programming of station and component electronic lockout levels via LightDesigner.

7) It shall be possible to adjust LCD contrast and brightness.

8) It shall be possible to program the station to dim during periods of inactivity.

6) STATIONS

A) The Lighting Control Stations shall be the Unison Heritage UH Series Control Stations as manufactured by Electronic Theatre Controls, Inc., or equal.

1) Mechanical

a) Unison Heritage Button and Button/Fader Stations shall operate using up to sixteen programmable faders and twelve programmable buttons.

b) All button/fader stations shall be available with white, cream, ivory, gray or black faceplates, fader knobs, and buttons.

1) Manufacturer's standard colors shall conform to the RAL CLASSIC Standard.

c) Stations shall have indicators lights at each button or fader.

1) Indicators shall be comprised of red, green and blue LED's

2) Indicator color and state (steady On, Blink, Off) shall be configured in software, and shall operate relative to the button or fader it is associated with.

d) All faceplates shall be designed for flush or surface mounting.

e) Station faceplates shall be constructed of ABS plastic and shall use no visible means of attachment.

f) Station faceplates shall be indelibly marked for each button or fader function.

g) The manufacturer shall supply back boxes for flush mounted half gang stations and for all surface mounted stations.

2) Functional

a) The Unison Paradigm Control System shall be designed to allow control of lighting and associated systems via Button, Button/Fader, and Interface or Astronomical time clock controls. System shall allow the programming of presets, sequences, macros and time clock events.

b) Station Button, Button/Fader, and Interface) control components shall be designed to operate standard default or custom system functions. Components shall operate default functions unless re-assigned via LightDesigner, the Windows-based configuration program.

c) Stations (Button and Button/Fader) shall allow programming of station and component electronic lockout levels via LightDesigner.

3) Electrical

a) Unison control station wiring shall be an Echelon® Link power network.

1) Link power shall utilize low-voltage Class II unshielded twisted pair, type Belden 8471 or equivalent, and one #14 ESD drain wire (when not installed in grounded metal conduit).

2) Touchscreen and Interface stations shall also require (2) #16 AWG stranded wires for 24Vdc operating power. 24Vdc wiring shall be topology free.

3) Network wiring may be bus, loop, home run, star or any combination of these.

4) Network insulation displacement connectors shall be provided with all stations.

**PART 3 EXECUTION**

3.1 INSTALLATION

A. Install all items in conformity with standard trade practices and Manufacturer's recommendations

B. Consult and coordinate work with trades doing adjoining work.

C. Position all items accurately as indicated in the Drawings and true to plumb line and level. Maintain maximum headroom and clearance at all points.

D. Do not uncrate, unpack, unwrap or install control console, video monitor(s), remote controls or other auxiliary control components until construction is complete and environment is clean and dust-free.

E. Dealer is responsible for all components required to install and complete an operating system.

(1) The Theatrical Dealer is responsible for the complete installation of the specified equipment. The installation shall be done by a licensed and bonded electrical contractor with over ten (10) years of experience installing theatrical systems and experienced in working with theatrical dealers. The electrical contractor shall be sub to the Theatrical Dealer and shall be responsible for both high and low voltage installation.

3.2 WIRING

A. Power Wiring

1. Install wiring as specified in Division 16 for hard wired connections. Install wiring in raceways except cable and plug connections.

2. Install power wiring with a separate neutral for each output circuit from main dimmer and for each house and stage lighting circuit.

3. Install power and control wiring for the stage lighting system in raceways that are unique to only that system.

B. Signaling, Remote-Control and Power-Limited Circuits

1. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.

2. Remote-control circuits associated with emergency lighting control shall be installed complying with Class 1 Circuit standards.

3. Install data-transmission cabling per manufacturer's recommendations

C. Wiring within enclosures: bundle, lace and train conductors to terminal points

D. Splices, Taps and Terminations: Make connections only on numbered terminal strips in junction, pull and outlet boxes; terminal cabinets; and equipment enclosures.

E. Remove wall plates and protect devices and assemblies during painting.

F. Support lighting fixtures, distribution components and accessories per manufacturer's recommendation. Equip all pipe-mounted equipment with safety cables that are secured to supporting pipe.

G. Ground equipment according to Division 16 Section.

3.3 IDENTIFICATION

A. Identify components, power and control wiring according to Division 16 Section.

B. Label each fixture, lighting outlet, distribution device and dimmer module with unique designation. Make designations on elevated components readable from floor.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Schedule electrical tests and visual and mechanical inspections with at least seven days' advance notice.

C. Visual and Mechanical Tests and Inspections:

1. Inspect each fixture, outlet, module, control and device for defects, finish failure, corrosion, physical damage, labeling by nationally recognized testing laboratory, and nameplate.
2. Exercise and perform operational tests on mechanical parts and operable devices according to manufacturer's written instructions.
3. Check tightness of electrical connections with torque wrench.
4. Verify proper protective device settings, fuse types and ratings.
5. Record results of tests and inspections.

D. Electrical Tests: Perform tests according to manufacturer's written instructions.

1. Continuity tests of circuits.
2. Operational Tests: Connect each outlet to a fixture and a dimmer output circuit so each dimmer module, dimmer control and output circuit, outlet, and fixture in a typical operating mode will be sequentially tested.

E. Correct deficiencies disclosed by tests and inspections, and retest deficient items. Verify that specified requirements are met.

F. Test Labeling: After satisfactory completion of tests and inspections, apply a label to tested components indicating test results, date and responsible organization and person.

G. Reports: Prepare a schedule of lighting outlets by number; indicate circuits, dimmers, connected fixtures and control-channel assignments. Prepare a schedule of control settings and circuit assignments for house control channels. Prepare written reports of tests and observations. Report defective materials, workmanship, and unsatisfactory test results. Include records of repairs and adjustments made.

3.5 CLEANING

A. The Contractor shall remove all paint spatters and other spots, dirt and debris from the equipment. Clean equipment and devices internally and externally using methods and materials recommended by the manufacturer.

3.6 CONTRACTOR STARTUP AND REPORTING

A. Contractor shall prepare and submit a complete set of record drawings, operation and maintenance data and certificates as outlined in this section.

B. Upon completion of all installation work, the contractor shall verify in writing to the owner that the work is complete and ready for final inspection. Final inspection shall be scheduled by the owner, school and the theatrical dealer within fourteen (14) days following the contractor's notice of completion.

(1) The Theatrical Dealer must be a qualified Engineering Representative of the manufacturer, must have a full-time factory trained technician on staff and shall visit the job site after the installation is complete and prior to the energization of the system to inspect, test and adjust the system. Instruction shall be provided for the Owners' representatives in the operation and maintenance of the system. These services shall not exceed one (1) day.

## 3.7 DEALER STARTUP AND REPORTING

A. Dealer shall prepare, lamp and align all ellipsoidal spotlights for cosine (hot center) alignment, prior to delivery to the owner. Dealer shall prepare, lamp and test all theatrical lighting fixtures prior to delivery to the owner.

B. Dealer shall prepare and supply to the contractor a complete set of record drawings, operation and maintenance data and certificates as outlined in this section.

## 3.8 COMMISSIONING AND DEMONSTRATION

A. Upon completion of all installation work, the Contractor and Dealer shall certify in writing to the School that the work is complete and ready for final observation. Final observation shall be scheduled by the Owner, the School, and the Theatrical Dealer within fourteen (14) days following the Contractor's notice of completion.

B. System testing shall include testing of control data network, documenting traffic utilization within the Network Data System requirements noted below in this Section. Testing shall also include verification of Wireless Handheld Remotes operational range as required.

C. After system checkout and adjustment, the Dealer's factory certified technician shall operate the system for the review of the Owner, the School, and the Theatrical Dealer.

D. Necessary adjustments or modifications shall be made as required.

E. As a condition of final completion, the Dealer's factory certified technician shall instruct the Owner's staff or representatives, under the observation of the School and Theatrical Dealer, in the operation and maintenance of the system.

1. Initial Instruction: This instruction session shall be scheduled for a maximum duration of eight (8) hours. While it may be possible to schedule this instruction session to coincide with the system checkout, such coincidence shall not be assumed. Instruction shall be scheduled by the Owner, the School, and the Theatrical Dealer to occur within fourteen (14) days following the Contractor's written notice.
2. Follow-up Instruction: This instruction session shall take place not less than thirty (30) days nor more than six (6) months from the initial instruction. This instruction

shall be scheduled by the Owner, shall be scheduled for a maximum duration of four (4) hours and will cover topics requested by the Owner.

F. The Dealer shall provide to the Owner video instructions on the operation and maintenance of the system. Information contained in video will cover all points of operation and maintenance covered in the instruction session with Owner's staff. A video recording of the actual instruction session is acceptable. Provide two (2) full copies of video instruction. Video format shall be DVD.

3.9 WARRANTY

A. Manufacturer shall offer a limited warranty (from date of delivery) for products under normal use and service to be free from defects in materials and workmanship for a period of eight years for Unison DR Rack and two years for control electronics.

B. Warranty shall cover repair or replacement of such parts determined defective upon inspection.

C. Warranty shall not cover any product or part of a product subject to accident, negligence, alteration, abuse or misuse. Warranty does not cover any accessories or parts not supplied by the manufacturer.

D. Warranty shall not cover any labor expended or materials used to repair any equipment without manufacturer’s prior written authorization.

3.10 DEALER SERVICES

A. Service shall be provided directly by the dealer and service visits shall be made within twenty four (24) hours of request.

B. Dealer shall maintain a 24-hour emergency service system. Upon owner contacting this system, return contact must be made within fifteen (15) minutes or less. Any dealer that does not supply a 24-hour service system must prove compliance and ability to supply emergency and after-hours service.

C. Dealer shall provide a single full-time on staff project manager from the outset through the completion of the project. This project manager shall be available for site meetings, site visits, phone meetings and any necessary functions relating to the successful completion of the project. This project manager shall be knowledgeable of all the equipment within the project and able to assist and troubleshoot challenges, either potential or realized, with the installing contractor when requested.

D. Dealer shall have on staff a minimum of one (1) ECPB certified member.

3.11 SUBSTITUTIONS

A. The system shall be as manufactured by Electronic Theatre Controls (ETC). There are no approved substitutes or alternates.

B. If the Theatrical Dealer elects to provide an alternate system all costs associated with the review and approval by the Owner shall be the responsibility of the Theatrical Dealer.

4.) ALTERNATE BID EQUIPMENT

4.1) POWER DISTRIBUTION – CONNECTOR STRIPS

A) General

1) Connectors shall be available as 20A, 50A and 100A grounded stage pin, 20A twist lock and 20A “U” ground (dual rated “T-slot”); other connectors shall be available as specified.

2) Internal wiring shall be sized to circuit ampacity and shall be rated at 125°C.

3) Pigtails shall be three-wire type “SOW” rubber jacketed cable sized for the maximum circuit ampacity.

4) Pigtails with 20 amp stage pin connectors shall be terminated using 12 gauge 4 way indent crimp (with inspection window) type where the wire is inserted and crimped directly in the socket.

5) Terminations shall be at one end using feed-through terminals individually labeled with corresponding circuit numbers.

a) 20 amp circuits shall use screwless tension clamp terminals listed for 20 – 8 gauge wire.

b) 50 amp circuits shall use compression terminals listed for 10 – 1 gauge wire.

c) 100 amp circuits shall use compression terminals listed for 8 – 2/0 gauge wire.

d) Terminals that place a screw directly on the wire are not acceptable.

6) Connector strips shall be supplied with appropriate brackets and hardware for mounting as shown on the drawings

a) Connector strips shall have junction brackets on 5’ centers.

b) Brackets shall be 1½” x .188” ASTM A 36 steel

c) Hardware shall be ASTM A307 grade 5.

7) A low voltage distribution system shall be available to incorporate DMX, Ethernet or other protocols as specified in the connector strip. Connector strips shall utilize a voltage barrier to accommodate these systems. Low Voltage signals shall enter the connector strip via a strain relief or connector mounted in a separate low voltage terminal box at the specified end of the connector strip. Up to four low voltage cables shall be supported for each connector strip.

a) Connector strips with multiple DMX outputs from the same source shall use DMX pass through assemblies consisting of a 6” panel with the one DMX output connector, one DMX input (Pass Through) connector, one DMX pass through (Bypass) switch, and a label detailing the use of the pass through assembly.

b) The bypass switch shall be used when no DMX devices are present at that location. When activated, the DMX pass through switch shall pass DMX directly through to the next DMX panel on the strip. The pass through switch shall have a mechanical indicator to show the operator that it has or has not been engaged

8) Connector Strips shall be Underwriter Laboratories (UL) and Canadian Underwriter Laboratories (cUL) LISTED.

B) Physical

1) Connector strips shall be 6.25” H x 3.3” D and fabricated from 18-gauge galvanized steel and finished in black fine-texture powder coat paint.

a) Covers shall be fabricated from 16-gauge galvanized steel

2) Connector strips shall be available in any length specified in increments of 6” and shipped fully wired with all splicing hardware.

3) Pigtails and outlets shall be spaced on 18” centers, or as otherwise specified.

4) Outlets shall be mounted on individual 3” panels and there shall be

5) No external terminal boxes shall be required for connector strips with 28 or fewer circuits unless otherwise specified.

6) Circuits shall be labeled on the connector strip with 2” lettering.

a) Circuit labeling options shall include:

1) Circuits shall be labeled on the front side of the connector strip with white lettering on black background labels.

2) Circuits shall be labeled on front and back sides of the connector strip with white lettering on black background labels.

3) Circuits shall be labeled on the front side of the connector strip with engraved lamicoid labels utilizing white lettering on black background labels.

4) Circuits shall be labeled on the front and rear sides of the connector strip with engraved lamicoid labels utilizing white lettering on black background labels.

5) Circuits shall be labeled on one side of the connector strip using individual circuit cover plates with lettering engraved in the cover and filled with the specified color.

6) Circuits shall be labeled using specified labeling per plans and drawings

7) Connector strips shall support optional LED indicators to indicate the presence of power at each local circuit. The indicator shall be red in color and mounted in the connector strip

a) The LED indicator shall be mounted in the lower right corner of the outlet panel

b) The LED indicator shall be mounted in the connector strip trough directly below the outlet panel.

c) The LED indicator shall be mounted in the center of the 3” plate directly below the circuit label for pigtail circuits

C) Junction Boxes

1) Gridiron junction boxes shall be available to accommodate SO or SOW cable wiring into connector strips mounted to non-fixed locations

2) Junction Boxes shall be fabricated from 16-gauge cold rolled steel with 14 gauge end panels. They shall be finished with fine-textured, scratch-resistant, black powder coat paint. Cover(s) shall be 16-gauge cold rolled steel and hinged to allow mounting in any direction.

4.2) ALTERNATE LIGHTING CONSOLE AND ACCESSORIES

A. General

1. The lighting control console shall be a microprocessor-based system specifically designed to provide complete control of stage, studio, and entertainment lighting systems. The console shall be the Ion as manufactured by Electronic Theatre Controls, Inc.,.

2. The system shall provide control of 3072 outputs on a maximum of 10,000 control channels, patched across any number up to 99,999. Output shall be distributed over an Ethernet network using Net3/ACN, ETCNet 2, Avab and/or ArtNet protocols. The user shall be able to control the application of protocols at an individual address level.

3. The system shall support full bi-directional RDM communication with compatible devices via Net3 DMX/RDM Gateways. RDM communication shall adhere to ANSII standard E1.20-2006 Entertainment Technology – RDM – Remote Device Management over DMX512 Networks. Supported RDM features shall include:

a. Discovery and identification of RDM capable devices.

b. Setting of start addresses, operating modes and additional settings as exposed by connected devices and controllable via RDM.

c. Viewing of Sensor data as provided by connected devices.

d. Error reported as provided by connected devices.

4. A maximum of 10,000 cues, 999 cue lists, 1000 groups, 1000 presets, 4 x 1000 palettes (Intensity, Focus, Color and Beam), 1000 effects, 1000 macros and 100 curves may be contained in non-volatile electronic memory and stored to an onboard hard disk or to any USB storage device.

5. Recorded cue lists may be played back simultaneously on a maximum of 200 faders. Channels shall respond to cue information by last instruction with discrete rate control provided for all cues. The console may be placed in Tracking or Cue Only mode by the user as a system default and overridden on individual record actions as required. HTP/LTP intensity flags, assert,

proportional, intensity master or manual master fade control and independent status may be placed on each cue list. It shall also be possible for a cue list to contribute to playback background states or to withhold such contributions.

6. A Master Playback fader pair and dedicated Grand Master/Blackout shall be provided.

7. Three USB fader wings or 60 sliders shall be added to the console, for a maximum of 300 submasters and/or 200 playback faders. USB fader wings may be rigidly connected to the main console to provide a "single connected unit" with no external cables required. The wings also may be connected via USB cables and used "on the side." Virtual fader control is also provided.

8. A high-resolution level wheel shall be provided to control intensity for selected channels and scrolling within selected displays. Four page-able high-resolution encoders shall be provided for control of non-intensity parameters. Non-intensity parameters shall be controllable via the encoders or keypad controls, without need of an external pointing device. A high-resolution rate wheel shall also be provided.

9. Rotary encoders for non-intensity parameters shall be labeled by means of an integral LCD display mounted below the encoders on the main console. The display shall show the currently loaded functions of the encoders based on the current selections. Systems using encoders with no LCD labeling shall not be acceptable.

10. Control and programming features for automated fixtures shall also include: a standard library of fixture profiles, the ability to copy and edit existing profiles and create new profiles, patch displays including channel and output addressing, 16-bit fade resolution, color characterization allowing color mixing and storing in Hue and Saturation or native device values.

11. System information, including playback status, live output and blind values for all record targets shall be displayed on a maximum of two external high resolution DVI monitors, or one SVGA monitor, which may also be touch-screen(s). Only one display shall be required for operation.

12. A context sensitive on-line Help feature shall explain and provide an example of the operation of each feature of the system.

13. A fully integrated Virtual Media Server feature shall allow the user to map images and animations to a rig array. 40 such maps may be created, each with 12 layers. Systems that rely on external hardware or software for this functionality shall not be acceptable.

14. An optional, full-functioning, detachable alphanumeric keyboard shall be supported. The keyboard shall allow labeling of channels, cues, presets, groups, palettes, effects, macros, curves and the show. An integral electronic keyboard shall be provided.

15. A row of softkeys shall be provided, which change function based on the selection and context of the console. These softkeys shall be labeled via an adjacent LCD display that shows their current functions at all times. Systems using softkeys with no LCD display shall not be acceptable.

16. Console software upgrades shall be made by the user via a USB port; changing internal components shall not be required. It shall be possible to install software updates in all consoles, processor units and remotes from one device over the network.

17. The console operating software shall be loaded into program execution memory from the internal hard drive when the console is powered. In the event of an uncontrolled shutdown, the console shall return to its last output state when power is restored.

18. Integrated dimmer monitoring features shall be provided to allow indication of dimming

system status, error states and dimmer load monitoring. Adjustment of dimmer configuration shall also be supported. Communications with the dimming system shall utilize ANSI E1.17 2006 - Entertainment Technology - Architecture for Control Networks.

19. Show data may be created and modified on a personal computer, using either Windows XP or Windows 7 operating systems, with a free offline editing application. The offline editor may also run natively on Intel-based Macintosh platforms using OS X. The program shall also allow output to visualization software supporting the same protocols as the lighting system.

20. A PC using Windows XP or Windows 7 or an Intel-based Macintosh computer using OS X running a client software application shall be able to connect to a control system via the network and view or modify current show data in an independent display environment, using an Eos Family Client Dongle. When connected without the dongle, the computer shall operate in Mirror Mode, with the device to be mirrored selectable by the user.

21. Synchronized backup shall be provided via another full console on the network or by use of a remote processor unit. The backup unit (either full console or rack mounted Remote Processor Unit (RPU) shall maintain synchronized playback with the master and shall take over control of the lighting system upon loss of communication with the master. Use of two RPUs to service and backup system output is also supported. Systems that do not offer this kind of instant backup from multiple sources shall not be acceptable.

22. A maximum of four users may access and interact with show data simultaneously. Each user shall have an individual workspace and channel partitioning shall be supported. User identification may be assigned to more than one control device, allowing users to work in tandem, or allowing a designer/ALD to mirror the current display format, mode and command line of the associated programmer. Partitioned control allows discrete control of channel/parameter groupings by user. Partitioned control may be easily enabled and disabled with no need to merge show data from multiple users.

23. Mirror mode shall allow the console displays and operating modes to be mimicked on another connected device. Alternatively, the console may mirror another device.

24. The system shall allow remote control from external devices as follows: Client software running on a PC connected to the network, a remote video interface with keyboard, a purpose-built wireless remote focus unit (Radio Focus Remote). Universal fader wings may be attached to any of these devices for local fader control. Systems without these remote control devices shall not be acceptable.

25. The system shall support a Telephone remote control that allows basic functions to be controlled from a standard wireless phone producing touch-tone signals. This allows the use of a standard telephone for a low cost remote control. Systems that do not allow this function shall not be acceptable.

26. Show files are saved across the system to all available integral hard drives simultaneously.

27. The system shall support up to 32 individual Time Code Event lists.

B. Controls and Playback

1. Manual Control and Programming Section

a. The console keyboard shall be grouped by function. Major groupings shall be record target functions, numeric keys, level assignment functions, display navigation functions and controls.

b. Non-intensity parameters may be set numerically or via the encoders. This control shall be fully interactive. In either case the current parameter value shall be displayed on the

console monitor and simultaneously on the console LCD display. Systems using only a local LCD or only a video monitor shall not be acceptable.

c. Only those parameters available for control in the active lighting system shall be displayed for control.

d. Lamp controls provide direct access to luminaire functions such as striking and dousing arc lamps and calibrating entire fixtures or individual mechanisms of fixtures, as provided by the luminaire manufacturer. User access to these features is normalized across all manufacturers for ease of use. Use of a “control channel” for accessing these functions shall not be required and systems requiring use of a control channel shall not be acceptable. Lamp control commands maybe e staged, and channels which have been sent lamp on commands so indicated in live.

e. Fan functions shall be provided both via command line operation and through encoder controls.

f. Highlight shall be supported, with user definable highlight values. Lowlight conditions may be defined for selected, but not specified channels. Rem Dim command, at specific levels by channel, may be optionally and automatically called with the highlight command.

g. Fixtures with CMY or RBG color mixing may be set with direct CMY or RBG controls, as well as the Hue and Saturation encoders and/or color picker. Color may also be set directly to a gel match, via a graphic selection tool or from the command line.

h. The Virtual Media Server function shall allow the user to create layouts of devices, identified as pixel maps. Media content (images, movies, text and procedurally generated effects) may then be applied, manipulated and stored. Stock content is provided and the user may import custom imagery and animations.

i. Macros may be set to run as default. Default macros called manually shall post to the command line, but executed via cue lists shall run in the background. The user may override this behavior by defining the macro to always execute in the foreground or the background, regardless of the recall method.

2. Playback Section

a. The master fader shall consist of a 60mm Master Fader pair with associated Load, Go and Stop/Back buttons. Additional playback faders may be configured via the virtual fader module or on the Universal Fader Wings.

b. It shall be possible to instantaneously halt an active cue, back to the previous cue, manually override the intensity fade or manually override the entire fade.

c. It shall be possible for a cue list to contribute to the background state or for the contents of each cue list to be withheld from such.

d. The playback faders shall have the following associate controls:

1) Freeze, which halts the output of the fader.
2) Stop Effect, which stops the action of an effect.
3) Filter, to assign filter states to a fader
4) Go to Cue 0, to reset a cue list.

3. Fader Wings (Optional)

a. Submaster and fader support shall be provided via optional fader wings. These wings are available in a 2x20 configurations. Three of these wings shall be connected to the desk via internal or external USB. Via paging, access is provided to all 300 faders, regardless of the number of physical wings attached.

b. The 2x20 fader wings shall include a full length LCD for labeling and identification functions. Each fader shall have two associated hard buttons for various operations. Systems without a local display or fewer than two buttons per fader shall not be acceptable.

c. Up to 300 proportional, fully overlapping additive, effect or inhibitive submasters may be defined. Submasters shall have colored LEDs to indicate submaster status. Each submaster may have fade up, dwell and down fade times. Each has a bump and assert/channel select button. Submasters may be set to independent, exclusive, shielded and proportional/intensity master control.

d. The submaster blind buffer shall be linked directly to live playback allowing live editing of live submaster content via the command line.

e. It shall be possible to set submaster values directly from the command line.

f. Up to 200 cue lists may be active concurrently.

4. Grand Master

a. A dedicated grand master and blackout button are provided.

b. The grand master shall proportionally fade intensity values to zero. Blackout shall send all intensity outputs to zero. Non-intensity outputs shall not be affected. No additional configuration shall be required to withhold non-intensity values from Grand Master and Blackout control.

C. Display Controls

1. Format shall change the view of selected displays.

2. It shall be possible for the user to choose which parameter categories or parameters (s)he wishes to display.

3. Flexichannel shall change which channels are viewed in selected displays, as follows:

a. All channels

b. Patched channels

c. Show channels

d. Active/Moved channels

e. Selected channels

f. Manual Channels

g. View channels (user identified list)

h. Channels with discrete timing

4. Expand shall extend the selected view sequentially across connected displays, vertically or horizontally.

5. [Time] depressed shall display discrete timing data. [Data] depressed shall display absolute values of referenced data.

6. User definable magic sheets shall provide alternative display of and access to channels and record targets. Multiple magic sheets may be created.

7. Playback status displays are provided with a variety of different formats. Indications are provided per cue for live moves (lights fading from zero and also moving non-intensity parameters) and dark moves (inactive lights which have stored non-intensity parameter moves).

D. Operating Modes

1. Live Mode

a. Channel lists may be constructed using the +, - and Thru keys as well as the direct selects. Channel selection and de-selection is fully interactive, regardless of the method used.

b. Levels may be set with the keypad, level wheel and non-intensity encoders. “Selected” channels shall be those last addressed and under keypad control.

c. Sneak shall be used to restore specified channels to background states, default values, or to send them to specified values, in user specified or default times.

d. Selected channels may be set at a level or held to current values while all other channels are set to zero using Rem Dim. Toggling Rem Dim shall restore all unselected channels to original levels. The Rem Dim level shall be user definable via the command line or with a default setup value.

e. Channels may be recorded into groups for fast recall of commonly used channels. 1000 groups shall be available. Groups shall store selection order. The Offset function supports rapid creation of ordered groups, including reverse and random order.

f. Parameter settings may be stored to Intensity, Focus, Color and Beam Palettes and to Presets. All referenced data may be stored to whole numbers or to up to 99 decimal places between each whole number. It shall be possible to store 1000 presets and 1000 of each palette type.

g. Any collection of channel data, as determined by the use of “Record”, “Record Only, selective store commands and/or parameter filters may be stored to palettes (as appropriate to the type) and presets.

h. The following conditions may be placed on a channel or channel parameter to be included with a cue record action.

1) Discrete fade time and/or delay
2) Block flag
3) Assert flag
4) IFCB Filters, which may be set at a parameter level.

i. 999 cue lists may be stored. Cues may be recorded in any order. Up to 99 decimal cues may be inserted between any two whole number cues. Each cue may contain a maximum of twenty parts. Parameters may be automatically assigned to specific parts or assigned when the part is created.

j. It shall be possible to record cues and cue parts with the following information:

1) Any collection of channel data, as determined by the use of “Record”, “Record Only” or selective store commands, combined with parameter filters.
2) Cue Level timing and delays for Intensity Up, Intensity Down, Focus, Color and Beam.
3) Follow or hang time
4) Link instruction
5) Loop value
6) Block, Assert, Allfade, Preheat and/or Mark Flag
7) Curve
8) Label and note
9) Execute list to trigger other activity

k. Non-intensity channel parameters may be marked (preset), in two ways. Automark presets any parameters transitions in the cue just prior to intensity becoming active. Automark may be disabled on a cue or cue part basis, enabling a “live” move. Alternatively, non-intensity parameters may be marked to a specific cue with a single command instruction. It shall not be necessary to store these parameters directly into the cue in which the movement is to occur.

l. Any channel parameter may be stored with an effect instruction. These effects may contain relative offsets from current value, or absolute instructions. Effects may be progressive action or on/off states. Entry and exit behaviors shall modify the channel parameters activity when beginning and ending the effect.

m. Update may be used to selectively add modified parameter data quickly to that parameter's current source. It shall be possible to update inactive record targets. It shall also be possible to update back to the current source of the move instruction without specifying that cue via Trace

n. Recall From quickly pulls specified data from record targets or other channels into the current view.

o. Copy To quickly copies selected data to specified channels or other record targets.

p. Address and channel check functions shall be provided.

q. Channel parameters may be "parked" at levels. Output addresses may also be parted directly. Parked levels shall not be added to any live record operations, nor may they be changed until the parked element is "unparked". Address Park shall also be provided.

r. About shall provide detailed status of selected channels or specified record targets. This shall include current source, current value, discrete timing, parked value, marked to and for indications. Background levels and current DMX output are also displayed. Channel usage indicates submaster and cue information and also provides a "dark moves" report on a per channel basis.

s. 1000 snapshots may be stored which instantly recall specified front panel and display configurations.

t. Live data may be displayed in a summary view or detailed table orientation.

u. Undo shall be used to sequentially step back through manual operations, record, update and delete actions. Redo functions shall be provided. Multiple undo commands may be executed at once.

v. Home shall set selected channels non-intensity parameters to their default values. User definable home, on a per-channel/per-parameter basis shall be provided.

w. Move shall allow all show data to be moved from one record target to another.

2. Blind

a. The Blind display allows viewing and modification of all record targets without affecting stage levels.

b. Record target data may be displayed in a summary view, a detailed table orientation or a spreadsheet view, which allows quick data comparisons, move and replace with functions.

c. Changes made in blind displays shall be automatically stored.

d. Blind editing shall be possible for all record targets.

e. Selection of what parameter data to view for blind editing shall be user configurable.

3. Patch Display

a. Patch shall be used to display and modify the system control channels with their associated library data.

b. Each channel may be provided with a proportional patch level, preheat, curve, label, swap and invert functions.

c. Offset functions in patch shall allow selection of channel ranges and shall allow the user to establish a "custom" footprint for any device output.

d. Custom color wheels, color scrolls and gobo wheels shall be defined in patch. These

devices shall be created with a simple table and graphical user interface supported by images of major manufacturers.

e. Copy to and Move functions shall be supported in patch.

f. RDM discovery and device monitoring shall be supported.

4. Setup/Browser

a. Setup shall access system, show and desk configurations.

b. The browser shall access show data storage, import, export, print to .pdf and clear functions, as well as show data utilities.

E. Dimmer Monitoring and Configuration

1. The lighting control system shall provide communication with an ETC Sensor+, Sensor3 or FDX dimming system for remote monitoring and configuration of show specific functions from within the console application.

2. Circuit level configuration and monitoring functions shall include but not be limited to:

a. Control mode (dimmable, switched, latch-lock, always on, off or fluorescent).

b. Curves

c. Control threshold

d. Min and Max Scale Voltage

e. Preheat

f. Scale load

3. Rack Status messages shall include but not be limited to:

a. State of UL924 panic closure

b. DMX port error/failure

c. Network error/failure

d. A, B, C Phase below 90 or above 139 volts and headroom warning

e. Ambient temperatures out of range.

4. Circuit status shall include but not be limited to:

a. Module type and location

b. Output level

c. Control Source

d. Overtemp

5. Advanced circuit feedback shall include but not be limited to:

a. Load higher or lower than recorded value

b. DC detected on output

c. SCR failed on/off

d. Breaker trip

e. Module has been removed

f. Load failure

g. Shutdown due to Overtemp

F. Training Options

1. Training packages shall be available customizable to the individual venue preferences and needs. The level of training (beginner, intermediate or advanced) may be selected and training may be defined as an element of system commissioning or deferred to a later time.

G. Interface Options

1. The console shall support a variety of local interfaces.

a. AC input.

b. USB (five ports for connecting devices such as an Alphanumeric keyboard, mouse, touch screens, USB Flash drive, fader wings, etc.) The desk shall provide four ports on the rear of the console and one on the control service itself.

c. Ethernet (one port) 802.3af compliant

d. Two DVI video output connectors, supporting a maximum of two DVI monitors at 1280x1024 resolution minimum.

e. One VGA output connector.

f. Up to six fader wings may be attached to the main console via internal or external USB connections. Systems that do not allow the addition of fader wings shall not be acceptable.

g. Two DMX512 Ports RDM Compatible

h. Contact Closure Trigger via D-Sub Connector

i. Phone Remote

j. MIDI In/Out (MIDI Time code, MIDI Show Control)

H. Accessories

1. iRFR and iRFR Preview (application for iPhone, iPod Touch and iPad units)

2. aRFR (application for Android devices)

3. 2x20 Universal Fader Wings

4. Net 3Gateways

a. Net3/ETCNet 2 to DMX/RDM Gateways (one to four ports)

b. MIDI/SMPTE Gateways

c. I/O Gateway with 12 analog inputs, 12 SPDT contact outputs, RD232 interface

5. Eos Family Client Software Kit

I. Synchronized Backup

1. An optional Backup system shall consist of one of the following combinations of devices:

a. Two networked Consoles

b. One (or more) Console with one Remote Processor Unit (RPU)

c. One (or more) Consoles with two Remote Processor Units (RPUs)

J. Physical

1. All operator controls and console electronics for a standard system shall be housed in a single desktop console, not to exceed 19” wide, 19” deep, 5.5” high, weighing 20 pounds. Consoles that will not fit in a 19" rack shall not be acceptable.

2. Console power shall be 95 – 240V AC at 50 or 60Hz, supplied via a detachable power cord.

END OF SECTION

SCHEDULE OF QUANTITIES

| | | |
|---|---|---|
| Dimmer Rack | SR3-48 | 1 |
| Control Module | CEM3 | 1 |
| Dimmer Modules | D20 | 48 |
| | | |
| Dimmer Rack | DRd12 | 1 |
| Processor | P-ACP | 1 |
| Dimmer Modules | D20 | 8 |
| Air Flow Modules | AFM | 4 |
| | | |
| Dimmer Bar | SB6 | 4 |
| | | |
| Control Equipment Rack | RACK | 1 |
| Control Rack Equipment | RACK | 1 |
| | | |
| Control Console | LMNT-60-500 | 1 |
| Monitor | MON | 1 |
| Worklight | WRKLGT | 1 |
| | | |
| Data Device | N31G-1F | 1 |
| | | |
| Plug In Stations | ECPB Uni/Net | 3 |
| | ECPB Net | 5 |
| | | |
| Architectural Controls | P-LCD-P | 1 |
| | UH10005 | 4 |
| | | |
| Floor Pocket Insert | 850X-B | 4 |

ALTERNATE BID EQUIPMENT

| | | |
|---|---|---|
| Connector Strips | 9950 | 4 |
| | | |
| Control console | ION-60-10,000 | 1 |
| Monitor | MON | 2 |

**I.** Bonding Requirements

**A.** Each proposal must be accompanied by a bidder's bond or a certified check payable to the owner, equal to ten percent (10%) of the amount of the bid as a guarantee that if the bid is accepted, the proper contract will be executed and performance bond filed.

**B.** The bidder shall furnish bonds covering faithful performance of the contract and payment of all obligations arising there under. Bond shall be furnished in such manner as the owner may prescribe, and issued by a surety company acceptable to the owner. The bidder shall be responsible for the cost of the bonds. The bidder shall deliver bonds to the owner no later than the date of the execution of the contract.

**II.** Governing Laws and Regulations

**A.** The bidder is responsible for ascertaining and complying with all ordinances, codes, and laws governing business practices and construction in the project location, including acquisition of necessary permits.

**B.** **Prevailing Wage Rates**: Contracts for work under this bid will obligate the contractor and his subcontractors to the prevailing wage provisions of Chapter 48, Sections 393-1 through 395-12, Illinois Revised Statutes providing for the payment of prevailing rate of wage to all laborers, workmen, and mechanics engaged on the work. A certified payroll is required to be submitted to Owner.

**C.** Substance Abuse Prevention on Public Works Projects Act: The successful bidder must be in compliance with State of Illinois HB-1855 (Public Act 095-0635), which amends the Prevailing Wage Act. Before an employer commences work on a public works project, the employer shall have in place a written program which meets or exceeds the program requirements in this Act, to be filed with the public body engaged in the construction of the public works and made available to the general public, for the prevention of substance abuse among its employees. The testing must be performed by a laboratory that is certified for Federal Workplace Drug Testing Programs by the Substance Abuse and Mental Health Service Administration of the U.S. Department of Health and Human Services.

# Bid Form

**Bid to:**

**Community High School District #128**
**50 North Lakeview Parkway, Suite 10**
**Vernon Hills, IL 60061**

**Project:**

**Libertyville High School**
**Studio Theater Lighting Control and Dimming Replacement**

**Bids Due: March 6th, 2013 by 1:00 PM**

**Attn: Yasmine Dada**

**Deliver sealed bids to:**
**Community High School District #128**
**Studio Theater Bid**
**50 Lakeview Parkway – Suite 101**
**Vernon Hills, IL. 60061**

**Firm Name:** _____

**Address:** _____

_____

_____

_____

**Phone/Fax:** _____

**Authorized Signature:**_____

**Printed** _____

**Signer's Title:** _____

**Bids for Libertyville High School Studio Theater Bid:**

**Base Bid Amount: $** _____ **Alt.#1**_____**Alt.#2**_____

**Plus Required Contingency: $ 15,000**

**Total Base Bid Amount: $** _____

**Additional information regarding bid amounts can be included on a separate page.**

**Please check any of the following that pertain to your company;**

**____ Minority owned business**
**____Female owned business**
**____ Business owned by persons with disabilities**

**BIDDER ELIGIBILITY CERTIFICATION**

Public Act 85-1295 (Illinois Revised Statutes, 1987, Chapter 38, Article 33E) requires that all the contractors bidding for public agencies in the State of Illinois certify that they are not barred from bidding on public contracts for bid rigging or bid rotation.

Following certification must be signed and submitted with bidder's bid proposal. **FAILURE TO DO SO WILL RESULT IN DISQUALIFICATION OF THE BIDDER.**

_____, as part of its bid
(Name of Contractor)
On a contract for _____ at

_____ for Community High School

District #128 hereby certifies that the said contractor is not barred from bidding on

The aforementioned contract as a result of a violation either Section 33E-3 or 33E-4 of

Article 33E of Chapter 38 of the Illinois Revised Statutes.

Firm Name: _____

Address: _____

_____

(Signature of Officer)

_____

(Title)

Subscribed and sworn before me

This _____ Day of _____, 2012

Notary Public

**BIDDER ELIGIBILITY CERTIFICATION**

**CERTIFICATE OF COMPLIANCE WITH ILLINOIS HUMAN RIGHTS ACT**

All successful contractors must comply with the provisions of the Illinois Human Rights Act (ACT) dealing with equal employment opportunities (Section 2-105, 775 ILCS 5/2-105) including equality of employment opportunity and the regulations of the Department of Human Rights of the State of Illinois and also must provide for the adoption and implementation of written Sexual Harassment Policies. The contract with the successful bidder will provide for this requirement. The statutory provisions require that the written Sexual Harassment policy included at a minimum the following information: (1) the illegality of sexual harassment, (II) the definition of sexual harassment under Illinois Law, (III) a description of sexual harassment, utilizing examples, (IV) a vendor's internal compliant process including penalty, (V) the legal recourse, investigative and complaint process available through the Department of Human Rights Commission, (VI) protection against retaliation as provide by Section 6-101 of the Illinois Human Rights Act.

Firm Name: _____

Address: _____

_____
(Signature of Officer)

_____
(Title)

Subscribed and sworn before me

This _____ Day of _____, 2012.

_____
Notary Public

**CERTIFICATE OF COMPLIANCE WITH THE ILLINOIS HUMAN RIGHTS ACT**